ORDER NO. ARD-8007079C

Service Manual

Cassette Deck

RS-M250

(Silver Face / Black Face)

Microprocessor-Controlled Stereo Cassette Deck
with Electronic Digital Tape Counter

DOLBY SYSTEM

This is the Service Manual for the following areas.
- [D] ..... For all European areas except United Kingdom.
- [B] ..... For United Kingdom.

RS-M250 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback
Tape speed:	4.8 cm/s
Wow and flutter:	0.04% (WRMS), ±0.13% (DIN)
Frequency response:	Metal tape; 20 – 20,000 Hz 30 – 18,000 Hz (DIN) 30 – 17,000 Hz ±3 dB
	CrO_2/Fe-Cr tape; 20 – 18,000 Hz 30 – 18,000 Hz (DIN) 30 – 16,000 Hz ±3 dB
	Normal tape; 20 – 17,000 Hz 30 – 16,000 Hz (DIN) 30 – 15,000 Hz ±3 dB
Signal-to-noise ratio;	Dolby* NR in; 67 dB (above 5 kHz) Dolby NR out; 57 dB (Signal level = max. recording level, Fe-Cr/CrO_2 type tape)
Fast forward and rewind time:	Approx. 80 seconds with C-60 cassette tape
Inputs:	MIC; sensitivity 0.25 mV, input impedance 50 kΩ applicable microphone impedance 400Ω – 10 kΩ LINE; sensitivity 60 mV, input impedance 47 kΩ
Outputs:	LINE; output level 700 mV, output impedance 3 kΩ or less, load impedance 22 kΩ over HEADPHONE; output level 85 mV (at 8Ω), load impedance 8 – 125Ω
Rec/pb connection:	5 pin DIN type; input sensitivity 0.25 mV, input impedance 6.8 kΩ output level 700 mV, output impedance 4.7 kΩ
Bias frequency:	85 kHz
Motor:	2-motor system; 1-Electrical DC governor motor, 1-DC motor
Heads:	2-head system; SX head for record/playback Ferrite double-gap head for erasure
Power requirement:	AC; 110/125/220/240 V, 50-60 Hz
Power consumption:	20 W
Remote:	For PLAY/REC/FF/REW/PAUSE/REC-MUTE/STOP with optional remote control RP-9645
Dimensions:	43.0 cm (W) × 11.9 cm (H) × 29.3 cm (D)
Weight:	5.3 kg

Specifications are subject to change without notice.

* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

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P.O. Box 288, Central Osaka Japan

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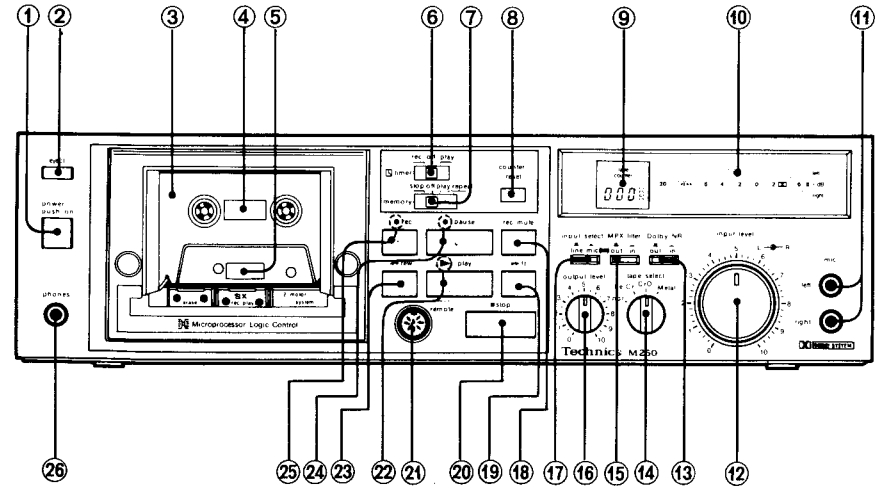
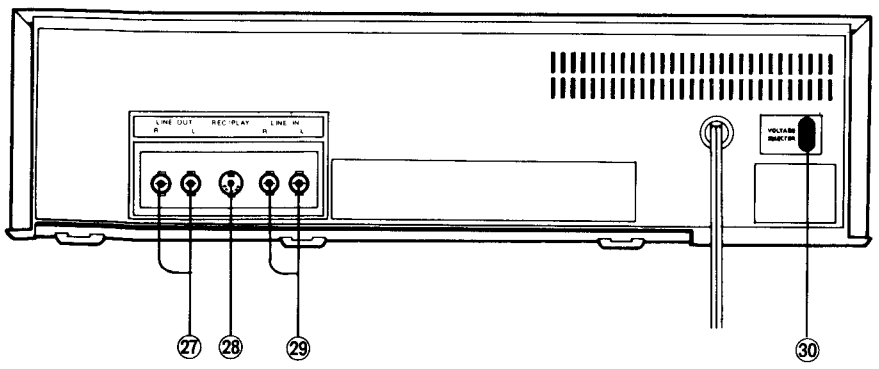
LOCATION OF CONTROLS AND COMPONENTS





① Power switch [power (push on)]
② Eject button (eject)
③ Cassette holder
④ Remaining tape display light
⑤ Head light
⑥ Timer start switch [timer (rec·off·play)]
⑦ Memory switch [memory (stop·off·play·repeat)]
⑧ Reset button (counter reset)
⑨ Digital tape counter (tape counter)
⑩ FL (fluorescent level) meters
⑪ Microphone jacks [mic (left·right)]
⑫ Input level controls [input level (L ◉ R)]
⑬ Dolby noise reduction switch [Dolby NR (out· in)]
⑭ Tape selector [tape select (nor·Fe-Cr·CrO_2·Metal)]
⑮ Multiplex filter switch [MPX filter (out· in)]
⑯ Output level control (output level)
⑰ Input selector [input select (line· mic) (DIN)]
⑱ Record-muting button (rec mute)
⑲ Fast forward button (▶▶ ff)
⑳ Stop button (■ stop)
㉑ Remote-control connector (remote)
㉒ Play button/Playback-indication lamp (▷ play)
㉓ Rewind button (◀◀ rew)
㉔ Pause button/Pause-indication lamp (○ pause)
㉕ Record button/Record-indication lamp (○ rec)
㉖ Headphones jack (phones)
㉗ Line output jacks (LINE OUT) (R, L)
㉘ Record/Playback connection socket (REC/PB)
㉙ Line input jacks (LINE IN) (R, L)
㉚ Voltage selector (VOLTAGE SELECTOR)

DISASSEMBLY INSTRUCTIONS

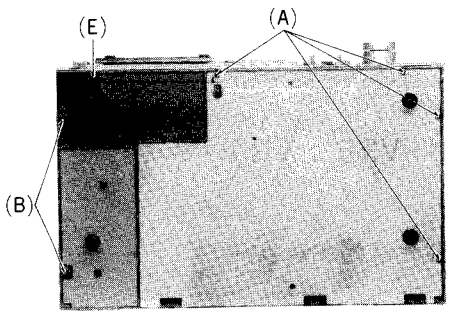


Fig. 1

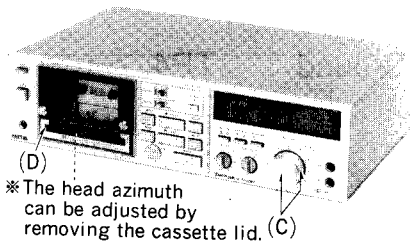


Fig. 2

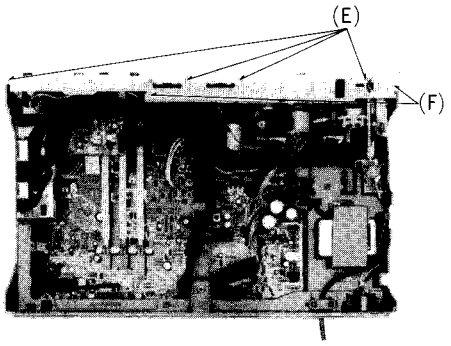


Fig. 3

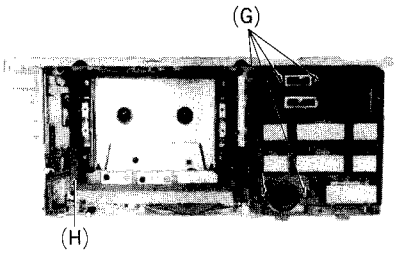


Fig. 4

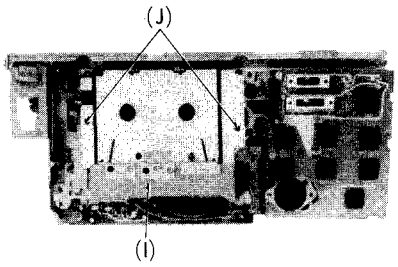


Fig. 5

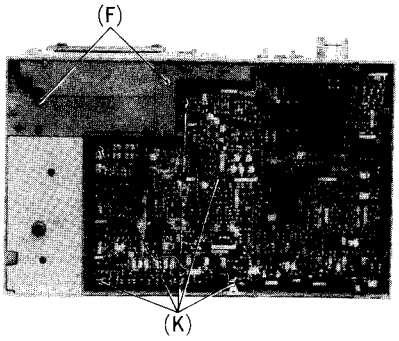


Fig. 6

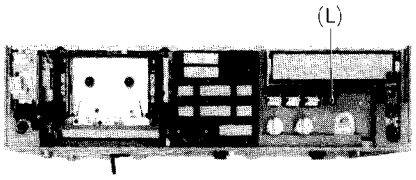


Fig. 7

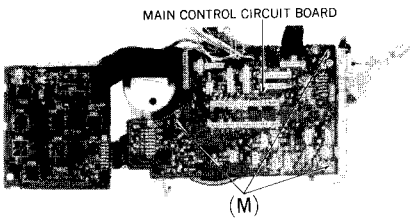
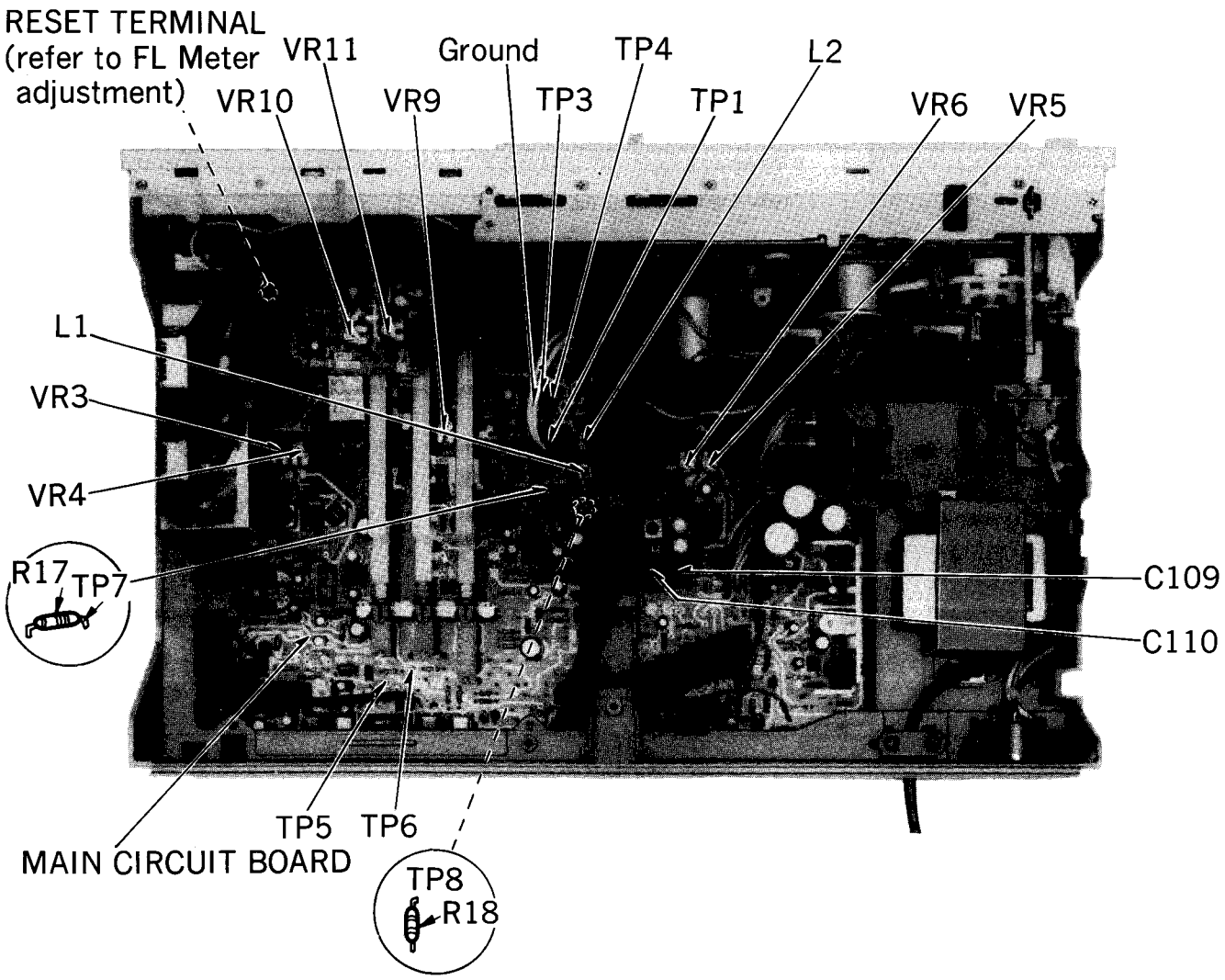


Fig. 8

Ref. No.	Procedure	To remove —— .	Remove —— .	Shown in fig. —— .
1	1	Bottom cover	• 4 screws ····· (A)	1
2	1→2	Case cover	• 2 screws ····· (B)	1
3	1→2→3	Front panel	• 2 control knobs ····· (C) • Cassette lid ····· (D) • 5 screws ····· (E)	2 2 1, 3
4	1→2→3→4	Mechanism unit	• 4 screws ····· (F)	3, 6
5	1→2→3→4→5	Operation button unit	• 4 screws ····· (G)	4
6	1→2→3→4→6	Chassis cover assembly	• Cassette holder ····· (H) • Head cover ····· (I) • 2 screws ····· (J)	4 5 5
7	1→2→3→7	Main circuit board	• 5 screws ····· (K) • Screw ····· (L)	6 7
8	1→2→3→4→8	Control circuit board	• 3 screws ····· (M)	8

MEASUREMENT AND ADJUSTMENT METHODS

CIRCUIT BOARDS AND ADJUSTMENT PARTS LOCATION



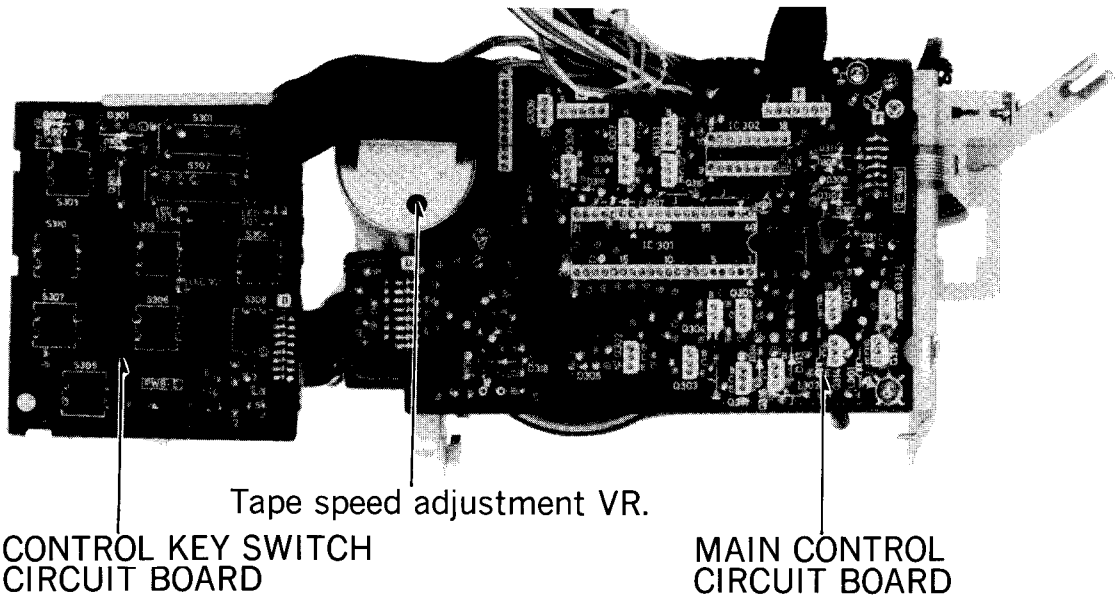
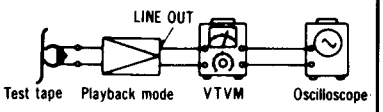
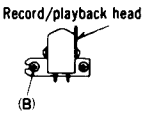
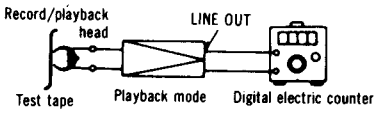
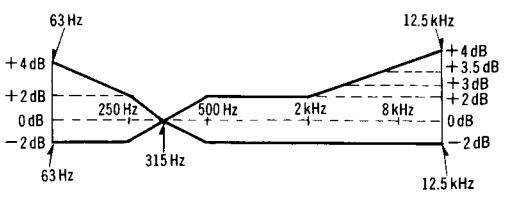
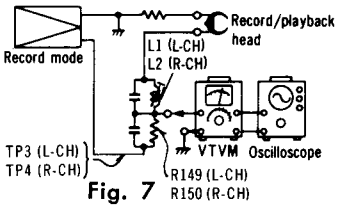
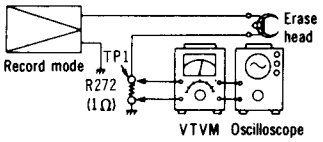
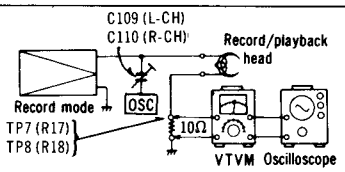
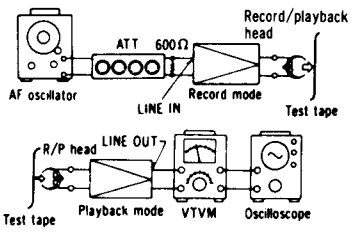


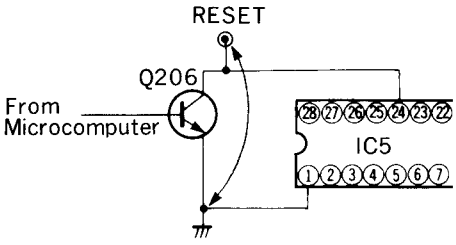
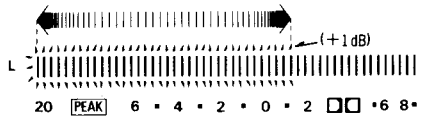
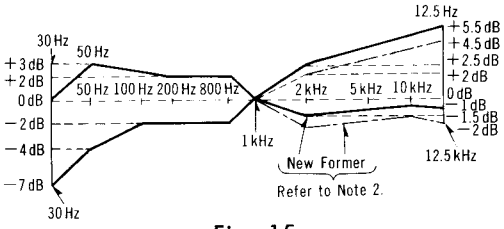
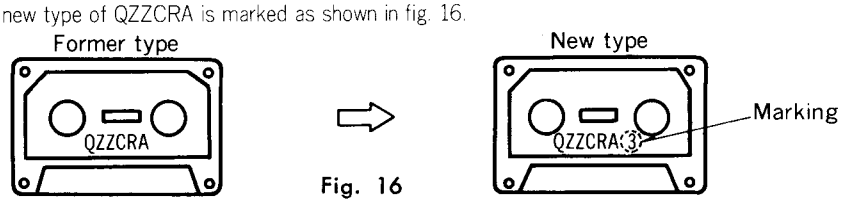
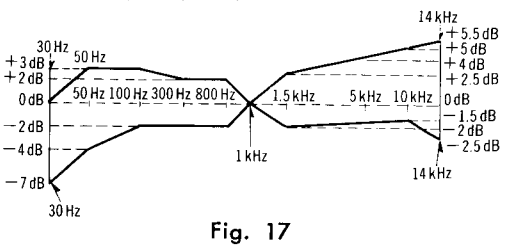
Fig. 1

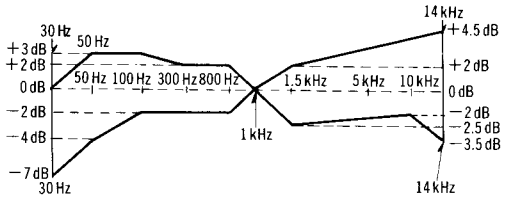
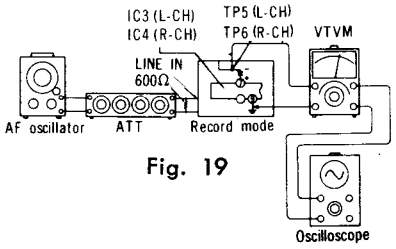
NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F)
- Dolby NR switch: OUT
- Tape selector: Normal
- Input selector: Line in
- Timer start switch: OFF
- Memory switch: OFF
- Multiplex filter switch: OUT
- Input level controls: Maximum
- Output level control: Maximum

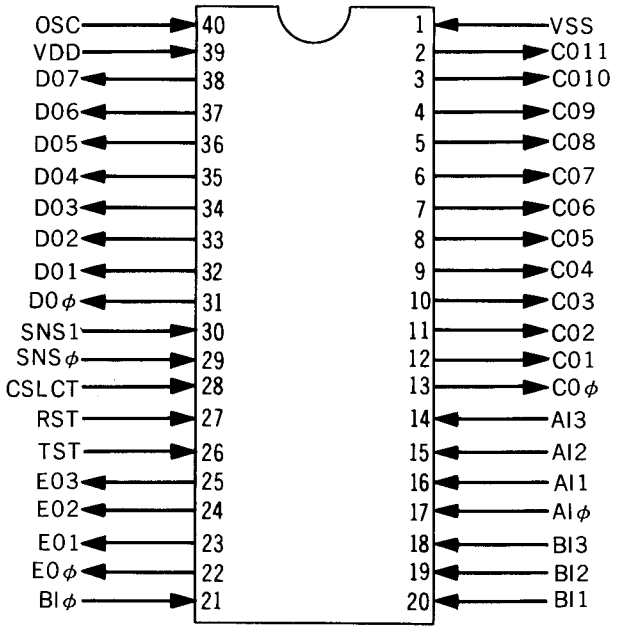
ITEM	MEASUREMENT & ADJUSTMENT
Ⓐ Head azimuth adjustment Condition: * Playback mode Equipment: * VTVM * Oscilloscope * Test tape (azimuth) ··· QZZCFM * Tape path viewer ··· QZZCRD	**Record/playback head adjustment** 1. Test equipment connection is shown in fig. 2. 2. Playback azimuth tape (QZZCFM 8kHz). 3. Adjust record/playback head angle adjustment screw (B) in fig. 3 so that output level at LINE OUT becomes maximum. 4. Measure both channels, and adjust levels for equal output. 5. After adjustment lock head adjustment screw with lacquer.  Fig. 2 **Erase head adjustment** 1. Test equipment connection is the same above but use the tape path viewer (QZZCRD) instead of test tape (QZZCFM). 2. Playback this tape. 3. Adjust screw (C) shown in fig. 4 so that the tape may not get curled or malformed by tape guide of the erase head. 4. After adjustment, lock head adjust screw with lacquer.  Fig. 3  Fig. 4
Ⓑ Tape speed Condition: * Playback mode * Tape selector ··· Normal position Equipment: * Digital electronic counter * Test tape ··· QZZCWAT	**Tape speed accuracy**  Fig. 5 1. Test equipment connection is shown in fig. 5. 2. Playback test tape (QZZCWAT 3,000Hz), and supply playbeck signal to frequency counter. 3. Measure this frequency. 4. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f-3{,}000}{3{,}000} \times 100\ (\%)$ where, f = measured value 5.. Take measurement at middle section of tape. **Standard value: ±1.5%** **Adjustment method** 1. Playback the test tape (middle). 2. Adjust so that frequency becomes 3,000Hz. 3. Tape speed adjustment VR shown in fig. 1. **Tape speed fluctuation** Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows: $\text{Tape speed fluctuation} = \frac{f_1-f_2}{3{,}000} \times 100\ (\%)$ f_1 = maximum value, f_2 = minimum value **Standard value: Less than 1.0%**
Ⓒ Playback frequency response Condition: * Tape selector ··· Normal position * Playback mode Equipment: * VTVM * Oscilloscope * Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 2. 2. Place UNIT into playback mode. 3. Playback the frequency response test tape (QZZCFM). 4. Measure output level at 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT. 5. Make measurement for both channels. 6. Make sure that the measured value is within the range specified in the frequency response chart. (shown in fig. 6). Playback frequency response chart  Fig. 6

ITEM	MEASUREMENT & ADJUSTMENT
Ⓓ Playback gain Condition: * Tape selector ··· Normal position * Playback mode Equipment: * VTVM * Oscilloscope * Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 2. 2. Playback standard recording level portion on test tape (QZZCFM 315 Hz, 0 dB), and using VTVM measure the output level at LINE OUT jack. 3. Make measurement for both channels. **Standard value: 0.7 V ± 1.5 dB** **Adjustment** 1. If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1). 2. After adjustment, check "Playback frequency response" again.
Ⓔ Bias leakage Condition: * Record mode * Input level controls ··· MAX * Output level control ··· MAX * Tape selector ··· Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 7. 2. Place UNIT into record mode. 3. Adjust trap coils L1 (L-CH), L2 (R-CH), so that measured value becomes minimum. 4. Make adjustment for both channels.  **Fig. 7**
Ⓕ Erase current Condition: * Tape selector ··· Metal position * Record mode Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 8. 2. Place UNIT into record mode and measure voltage at test point 1. 3. Determine erase current with the following formula: $\text{Erase current (A)} = \frac{\text{Voltage across both ends of R272}}{1\ (\Omega)}$ **Standard value: 145 ± 5 mA (Tape selector ··· Metal)** 4. If measured value is not within standard, adjust VR9.  **Fig. 8**
Ⓖ Bias current Condition: * Record mode * Tape selector ··· Normal position ··· Fe-Cr position ··· CrO_2 position ··· Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 9. 2. Place UNIT into record mode, and tape selector to normal position. 3. Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\Omega}$ **Standard value: around 330 μA (Normal position)** 4. Adjust C109 (L-CH) and C110 (R-CH) (shown in fig. 1). 5. Set the tape selector to each position. 6. Make sure that the measured value is within standard. **Standard value: around 370 μA (Fe-Cr position)** **around 415 μA (CrO_2 position)** **around 700 μA (Metal position)**  **Fig. 9**
Ⓗ Overall gain Condition: * Record/playback mode * Normal position * Input level controls ··· MAX * Output level control ··· MAX * Standard input level; MIC ····· −72 ± 3.5 dB LINE IN ··· −24 ± 3.5 dB Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω) * Test tape (reference blank tape) ··· QZZCRA for Normal	1. Test equipment connection is shown in fig. 10. 2. Place UNIT into record mode, and normal tape mode. 3. Supply 1 kHz signal (−24 dB) from AF oscillator, through ATT to LINE IN. 4. Adjust ATT until monitor level at LINE OUT becomes 0.7 V. 5. Using test tape, make recording. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V. 7. If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH). 8. Repeat from step 2.  **Fig. 10**

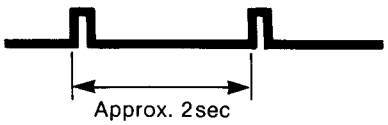
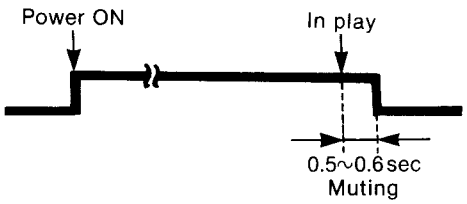
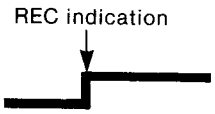
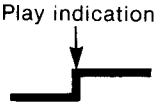
ITEM	MEASUREMENT & ADJUSTMENT
❶ Fluorescent meter Condition: * Record mode * Input level controls ··· MAX * Output level control ··· MAX * Tape selector ··· Normal position Equipment: * VTVM * AF oscillator * ATT	1. Test equipment connection is shown in fig. 10. 2. As shown in fig. 11, connect the collector of Q206 and ground. 3. Supply 1 kHz signal (−24 dB) to the LINE IN jack, then press the record button. 4. Adjust the ATT so that the output level at LINE OUT jack becomes 0.7 V (The input level at this condition is termed the standard input level). 5. Adjustment at "−20 dB". A. Adjust the ATT so that input level is −20 dB below standard recording level. B. Adjust VR11 so that the −20 dB segment lights up in the −20 dB ± 0.8 dB range (L-CH ONLY) (See fig. 12). 6. Adjustment at "0 dB". A. Adjust the ATT so that the output level at LINE OUT jack becomes 0.7 V. (The input level at this condition is termed the standard input level.) B. Adjust VR10 so that the +1 dB segment lights up in the 0 ± 0.2 dB range of the standard input level (See fig. 13). 7. Repeat twice between steps 5 and 6 above. 8. Adjust ATT and check that all segments light up when an input signal level is increased to 10 dB higher than the standard input level (See fig. 14).  Fig. 11  Fig. 12  Fig. 13  Fig. 14
❷ Overall frequency response Condition: * Record/playback mode * Tape selector ··· Normal position ··· Fe-Cr position ··· CrO_2 position ··· Metal position * Input level controls ··· MAX * Output level control ··· MAX Equipment: * VTVM * AF oscillator * ATT * Resistor (600 Ω) * Test tape (reference blank tape) ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRY for Fe-Cr ··· QZZCRZ for Metal	**Note: 1** Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response). **Note: 2** Test tape QZZCRA to be supplied after July 1980 has higher recording sensitivity in the middle and high frequency range. Overall frequency response chart (Normal)  Fig. 15 * This chart indicates the standard values for the new type of QZZCRA when in use. * This chart indicates the standard values for the former type of QZZCRA when in use. The new type of QZZCRA is marked as shown in fig. 16.  Fig. 16 1. Test equipment connection is shown in fig. 10. 2. Place the test tape (QZZCRA) in the cassette holder. 3. Place UNIT into record mode, and tape selector to normal position. 4. Supply 1 kHz signal from AF oscillator through ATT to LINE IN. 5. Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU). Overall frequency response chart (Metal, CrO_2)  Fig. 17

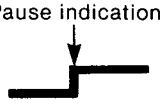
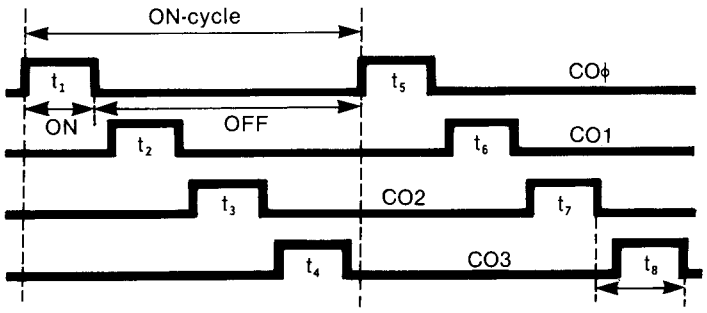
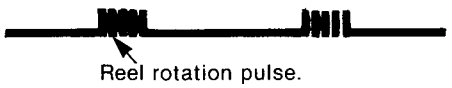
ITEM	MEASUREMENT & ADJUSTMENT
	6. At this time, LINE OUT level indicates 0.07 V. 7. Record each frequency 30 Hz, 100 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz, 12 kHz, and 13 kHz (14 kHz for CrO_2 and Fe-Cr, 16 kHz for Metal). 8. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz. 9. Make sure that the measured value is within the range specified in the overall frequency response chart (shown infig. 15). 10. Change test tape to Metal (QZZCRZ), CrO_2 (QZZCRX) and Fe-Cr (QZZCRY). 11. Set the tape selector to each position. 12. Measure as same as manner above. 13. Make sure that the measured value is within the range specified in the overall frequency response chart for Fe-Cr, CrO_2 and Metal tape shown in fig. 17 and 18. 14. If measured value is not within standard, adjust C109 (L-CH), C110 (R-CH). Overall frequency response chart (Fe-Cr)  Fig. 18
Ⓚ Dolby NR circuit Condition: * Record mode * Input level controls ··· MAX * Output level control ··· MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω)	1. Test equipment connection is shown in fig. 19. 2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain −34.5 dB at TP5 (L-CH), TP6 (R-CH) (frequency 5 kHz). 3. Confirm that the value at IN position is 8 (±2.5) dB greater than the value at OUT position of Dolby NR switch.  Fig. 19

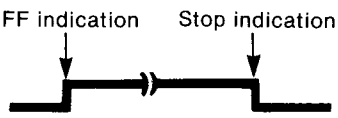
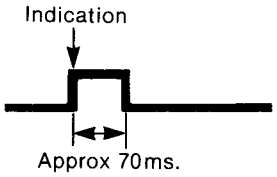
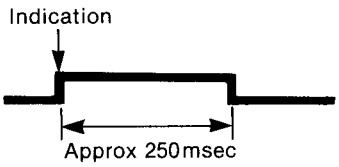
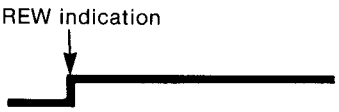
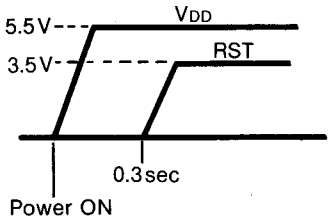
MN1400RS: TERMINATION (BOTTOM VIEW)

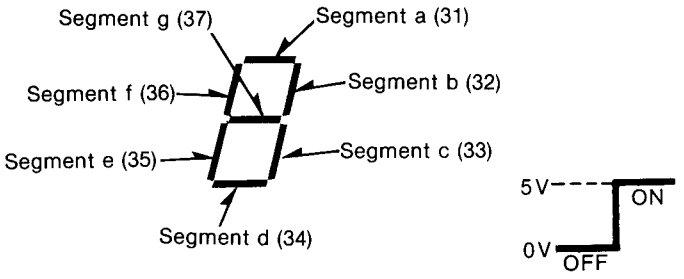
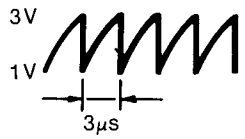


MN1400RS: EACH TERMINAL FUNCTION AND WAVEFORM

Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	No connection	Not used.
3.	CO10	FL meter reset	 This output is for resetting the Peak Hold of the FL Meter. The pulse 2.5msec. width is transmitted in approx. 2-second cycles, regardless of the mechanism operation.
4.	CO9	No connection	Not used.
5.	CO8	No connection	Not used.
6.	CO7	Muting	 "L" level 0.5 to 0.6 second after "PLAY" finish. "H" level in PAUSE, FF, REW STOP. "L" level approx. 0.3 second after "REC PAUSE" is switched to REC. "L" level approx. 0.3 second after command in case PAUSE mode is set to REC command.
7.	CO6	REC indication	 "H" level simultaneously with REC indication. "H" level immediately after power is ON in TIMER REC mode. "H" level held if in TIMER REC position, when STOP AUTO RESET mechanism operates.
8.	CO5	PLAY indication	 "H" level simultaneously with PLAY indication. Same as the above for TIMER PLAY and STOP AUTO RESET.

Terminal No.	Symbol	Name	Function/operation
9.	CO4	PAUSE indication	Pause indication  "H" level simultaneously with PAUSE indication.
10. 11. 12. 13.	CO3 CO2 CO1 COϕ	FL grid & input SW. scan FL grid & input SW. scan FL grid & input SW. scan FL grid & input SW. scan	
14. 15. 16. 17.	Ai3 Ai2 Ai1 Aiϕ	Input SW read Input SW read Input SW read Input SW read	Each switch is read in accordance with the scans of COϕ to 3. STOP SW, MEMORY STOP, TIMER REC and COUNTER RESET are connected to Aiϕ. If only STOP SW and MEMORY STOP are closed, their waveforms are as follows;  HALF SW and HALL IC output are connected to Ai3. The waveforms during FF or REW operation are as follows; 
18. 19. 20. 21. 29. 30.	Bi3 Bi2 Bi1 Biϕ SNSϕ SNS1	REW key FF key PLAY key STOP key REC key PAUSE key	Push the switch.  "H" in the normal case, "L" when the switch is pushed.

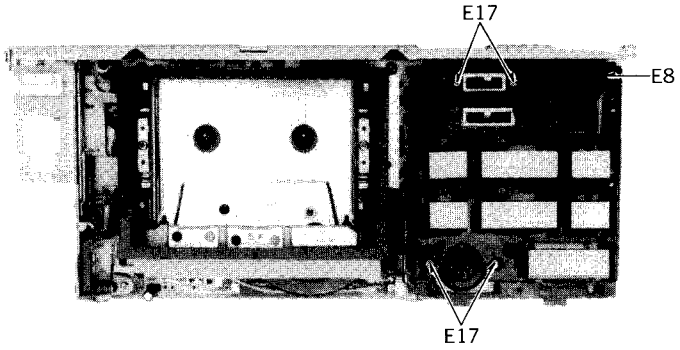
Terminal No.	Symbol	Name	Function/operation
22.	EOϕ	Brake plunger	 "H" during FF/REW operations.
23.	EO1	Trigger plunger	 "H" until MODE SW is closed after the input to switch the mechanism, such as PLAY, PAUSE, STOP, etc. has been applied. (Approx. 70ms. depending on the mechanism condition.)
24.	EO2	Motor CL	 "H" until MODE SW is changed from "close" to "open" following the indication that the mechanism mode has been changed.  "H" in REW operation.
25.	EO3	Motor UNCL	Same as the above in MODE conversion. "H" during FF.
26.	TST	Chip test	Connected to GND.
27.	RST	RESET	Computer's RESET terminal. Reset is less than 0.8V. 

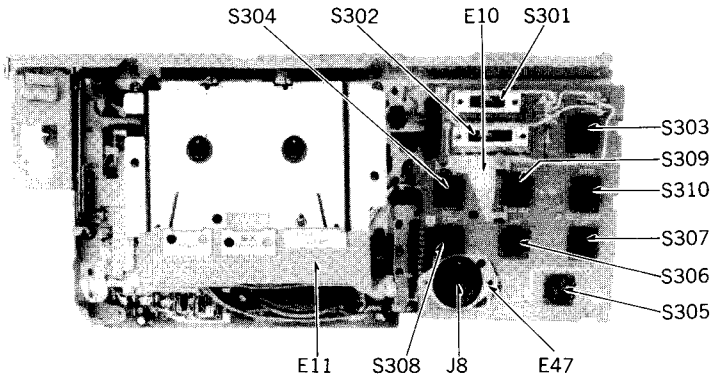
Terminal No.	Symbol	Name	Function/operation
28.	CSLCT	CSLCT	Connected to VDD.
31.	DOϕ	FL counter Segment a	
32.	DO1	FL counter Segment b	
33.	DO2	FL counter Segment c	
34.	DO3	FL counter Segment d	
35.	DO4	FL counter Segment e	
36.	DO5	FL counter Segment f	
37.	DO6	FL counter Segment g	
38.	DO7	No connection	Not used.
39.	VDD	Power source	Operated at 4.5V to 6.0V.
40.	OSC	Oscillation terminal	 Oscillation is approx. 300kHz. Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements. Use COϕ to 3 in measuring the computer's velocity; Approx. 155Hz in STOP condition.

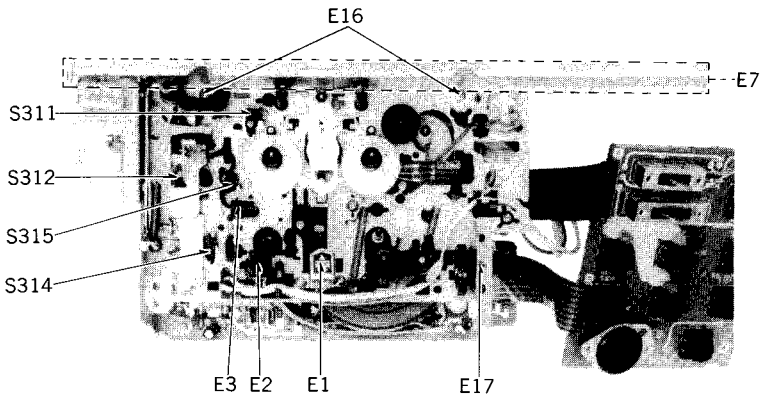
TROUBLESHOOTING

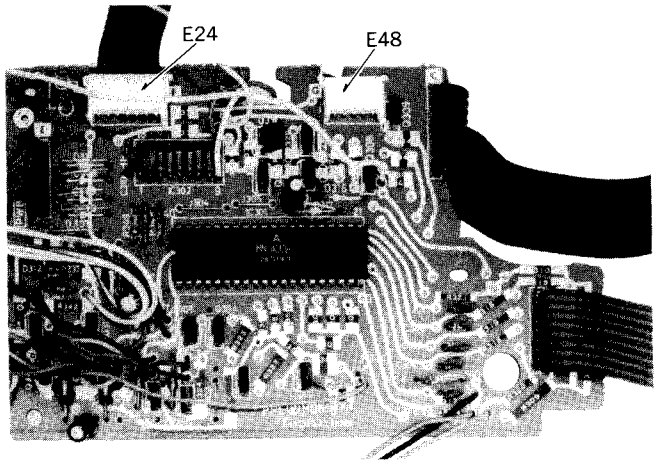
Fault	Probable cause	Microcomputer terminal to check	Relevant mechanism parts	Relevant external parts
Mechanism does not operate at all.				
FL not lighting	Microcomputer not operating			
	Power not supplied.	39 (VDD)		
	Clock not oscillating.	40 (OSC) 10 to 13		C310, R347
	Reset locked.	27 (RST)		C309, D317
	Microcomputer normal. (Scan normal)			
	Connection to FL Driver.	10 to 13 31 to 37		
FL lighting OK. (MODE LED not lighting.)	Half SW. closed.	14 (Ai3)	Half SW.	D311
MODE indicator lighting OK.	Motor circuit faulty.	24, 25	Motor connection	Q312 to 315
Mechanism defective.				
FF/REW reverse rotation.	Reverse connection of motor.	24, 25	Motor connection	
FF/REW motor rotating, reel not rotating.	Brake plunger not being with drawn.	22 (EOϕ)	Brake plunger disconnection, etc.	Q313
CAM continuous rotation in PLAY.	MODE SW. defective.	15 (Aiz)	MODE SW.	D310
Motor rotating in PLAY, but CAM's not switched.	Trigger plunger not operating	23 (EO1)	Trigger plunger	Q317
Motor rotates in revese and does not stop after switching to PLAY or PAUSE.	PLAY or STOP SW, defective.	16 (Ai1) 17 (Aiϕ)	STOP PLAY Leaf SW.	D308 D309
REC IND. due not light up. (Operation is normal)	LED or drive transistor defective.	7 (CO6)		Q305, R324
PLAY IND. dues not light up.	-do-	8 (CO5)		Q304, R323
PAUSE IND. duse not light up.	-do-	9 (CO4)		Q303, R322
Not counting.	Hall IC faulty, buffer circuit faulty.	14 (Ai3)	Reel magnet	IC303 (Hall IC) Q302, D306
AUTO STOP functioning soon after operation begins.	Same as the above. (Not counting)			
No muting.	Muting output connection etc.	6 (CO7)		
No peak-resetting.	Connection	3 (CO10)		
Accidental erase prevention mechanims not functioning.	Leaf SW	15 (Ai2)	Accidental erasure Leaf SW	D307
Operating during EJECT.	Half detection SW.	14 (Ai3)	Half detection SW.	D311

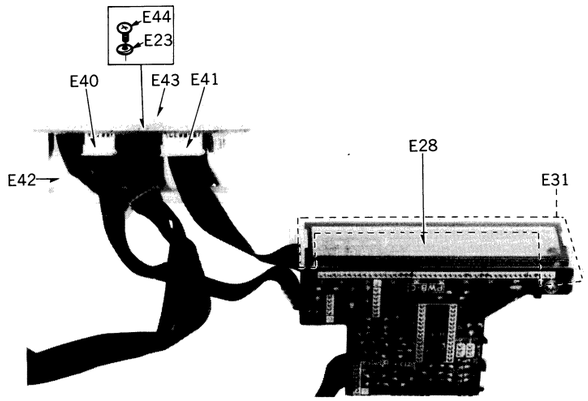
ELECTRICAL PARTS LOCATION

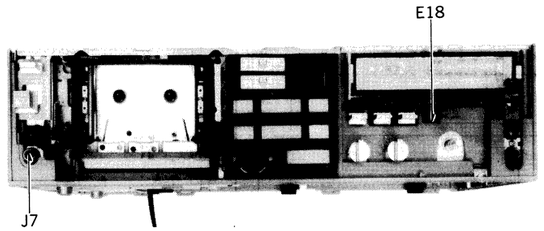


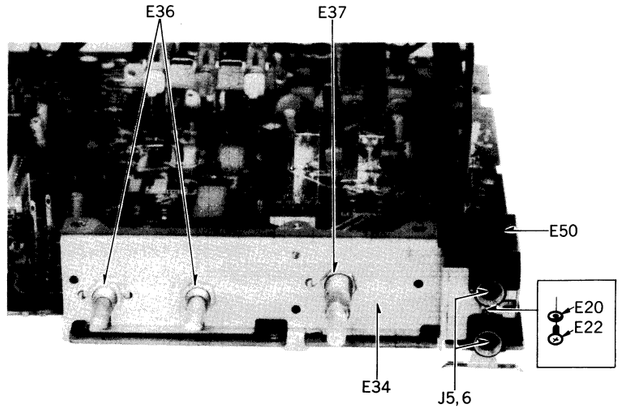


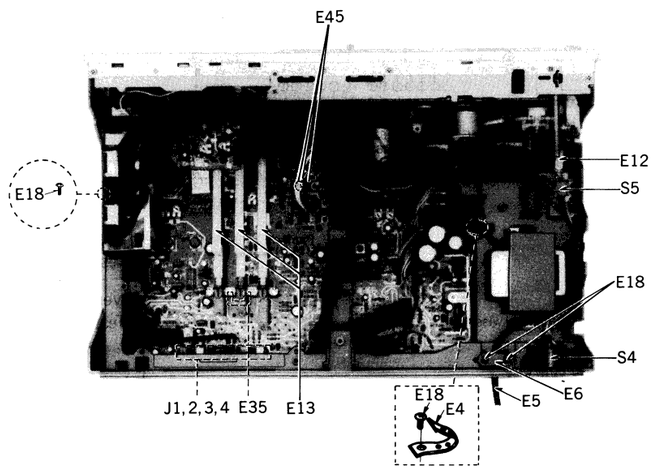


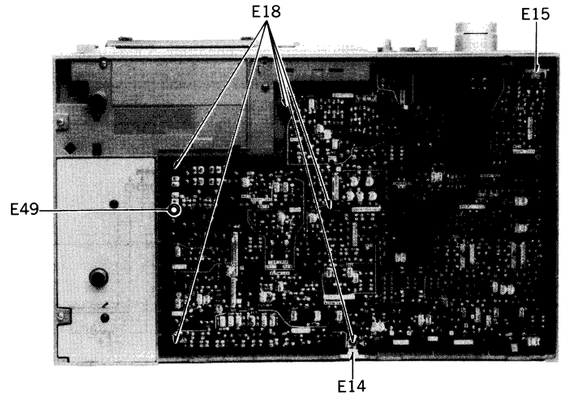


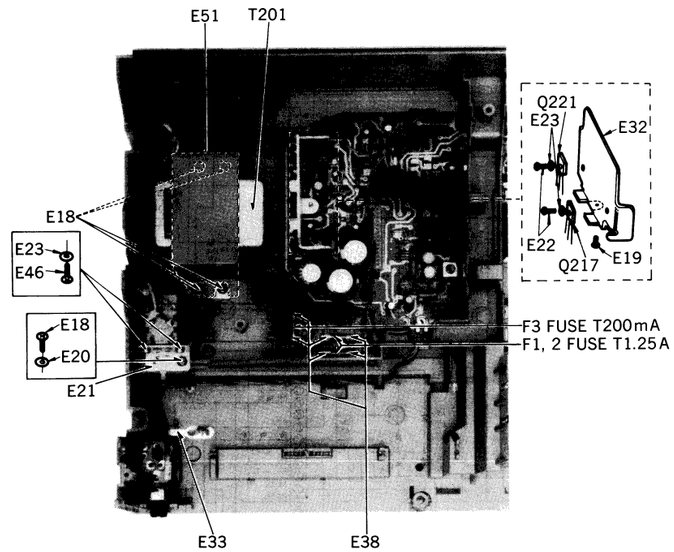


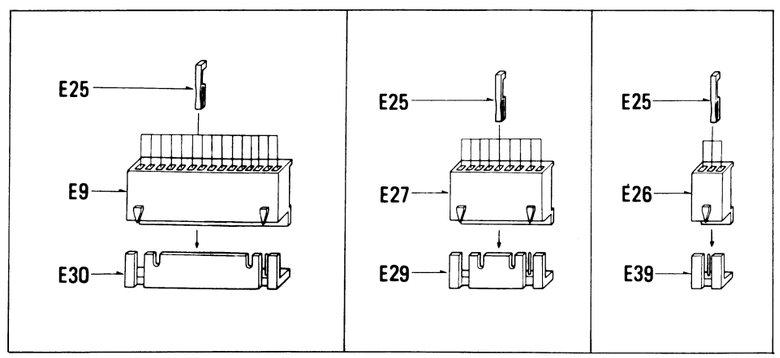












NOTE: △ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.		Part No.	Part Name & Description
			ELECTRICAL PARTS
E1		QWY4123Z	Record/Playback Head
E2		QWY2138Z	Erase Head
E3		XAMQ44S200	Mechanism Pilot Lamp
E4		RME144ZA	Cord Clamper
E5	ⓓ△	SJA88	AC Power Cord
※For all European areas except United Kingdom.			
	ⓑ△	RJA45ZCK	〃
※For United Kingdom.			
E6		QTD1164	Cord Bushing
E7		QMA3980	Reinforcement Angle
E8		QMA1880	Button Chassis
E9		QJS1925TN	15 Pin Socket
E10		QKJ0418	LED Holder
E11		QGH1091	Head Cover
E12		QMR1888	Power Switch Rod
E13		QMR1889	Switch Rod
E14		QJC0035	Earth Plate-A
E15		QJC0036	Earth Plate-B
E16		XTN3+8B	Screw ⊕3×8
E17		XTN26+6B	Screw ⊕2.6×6
E18		XTN3+12B	Screw ⊕3×12
E19		XTS3+10B	〃
E20		XWG3	Washer
E21		QMA3979	Switch Angle
E22		XSN3+8S	Screw ⊕3×8
E23		XWA3B	Washer
E24		QJS1959S	7 Pin Jumper Socket
E25		QJT1054	Contact
E26		QJS1921TN	3 Pin Socket
E27		QJS1923TN	9 Pin Socket
E28		QSIFM001F	FL Meter
E29		QJP1923TN	9 Pin Post
E30		QJP1925TN	15 Pin Post
E31		QKJ0417	Meter Holder
E32		QTH1153	Heat Sink
E33		QMF1816	Earth Terminal
E34		QMA3978	Volume Angle
E35		QMA3847	Power Switch Angle
E36		XNS8	Nut
E37		XNS9	〃
E38	△	QTF1054	Fuse Holder
E39		QJP1921TN	3 Pin Post
E40		QJS1961S	5 Pin Jumper Connector
E41		QJS1962S	7 Pin Jumper Connector
E42		QTS1519	Shield Plate
E43		QMA4019	Circuit Board Angle
E44		XSN3+6S	Screw ⊕3×6
E45		QJT1041	Check Pin
E46		XSN3+6S	Screw ⊕3×6
E47		QMF2136	Socket Holder
E48		QJS1958S	5 Pin Jumper Socket
E49		QBK7143	Washer
E50		QTS1523	Microphone Shield Plate
E51		QTS1524	Transformer Shield Plate

SCHEMATIC DIAGRAM

MAIN AMP CIRCUIT

Q1, 2, 222 2SD1011 (S, R, T) REC/PLAY SELECT
Q201 2SA921 (S, R) REC/PLAY SELECT
Q5, 6 2SD965 REC/PLAY SELECT
Q7, 8 2SD626H (SMG, RMG) (2SD636) PLAY EQ SELECT
Q9, 10 2SD636H (SMG, RMG) (2SD636) PLAY AMP MUTE
Q11, 12 2SD636H (SMG, RMG) (2SD636) INPUT MUTE
Q13, 14, 15, 16 2SD1010 (R, S) REC/PLAY SELECT
Q202, 203 2SB641 (SMG, RMG) REC/PLAY SELECT
Q204 2SD636H (SMG, RMG) (2SD636) REC/PLAY SELECT
Q23, 24, 25, 26 2SD636H (SMG, RMG) (2SD636) LINE AMP
Q17, 18, 19, 20 2SD1010 (R, S) REC/PLAY SELECT
Q31, 32 2SD965 REC MUTE
Q27, 28 2SD638 (SMG, RMG, QMG) DIN OUT MUTE
Q29, 30 2SD965 LINE MUTE
Q33, 34 2SD636H (SMG, RMG) (2SD636) RECORD AMP
Q35, 36 2SD636H (SMG, RMG) (2SD636) METER, HEAD PHONES AMP
Q37, 38 2SD636H (SMG, RMG) (2SD636) METER, HEAD PHONES AMP
Q39, 40 2SA786 (RF, QF) METER, HEAD PHONES AMP

IC1 UPC1186H MIC AMP
IC2 UPC1186H PLAY EQ AMP
IC3, 4 NE646B DOLBY NR

LINE IN J1
MIC IN J5
DIN
ERASE HEAD
LINE OUT J3
DIN OUT
HEADPHONES JACK J7
J2
J6
J4
S1-1 S1-2 S1-3 S1-4 S2-1 S2-2 S3-1 S3-2 S4-1 S4-2 S4-3 S4-4
IC1-1 IC1-2 IC2-1 IC2-2 IC3 NE646B IC4 NE646B
L1 L2 L3 L4 L7 L201
VR1 VR2 VR3 VR4 VR5 VR6 VR7 VR8 VR9 VR10
Metal CrO2 FeCr
MOTOR
FL METER
AC POWER

Q21, 22 2SD636H(SMG, RMG) (2SD636) REC/PLAY SELECT

Q208 2SD592NC (S, R) (2SD592) BIAS OSC
Q209 2SD946 DC. AMP
Q210 2SD636H (SMG, RMG) (2SD636) BIAS OSC ON/OFF
Q211 2SB641 (SMG, RMG) MUTE
Q212, 213, 214 2SD636H (SMG, RMG) (2SD636) RESET PULSE GENERATER
Q215 2SB641 (SMG, RMG) REC MUTE
Q216 2SD1010 (R, S) RESET PULSE GENERTER
Q223 2SC1980 (T, S, R) PROTECTER
Q218, 219 2SC592NC (S, R) (2SD592) REGULATOR
Q220 2SD636H (SMG, RMG) (2SD636) REGULATOR
Q221 2SD946 REGULATOR
Q206 2SD636H (SMG, RMG) (2SD636) PEAK HOLD SET/RESET
Q207 2SD636H (SMG, RMG) (2SD636) METER MUTING

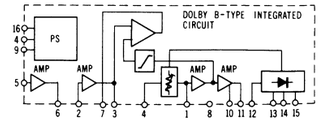
NOTES:

- S1-1—S1-4 ..... Input select switch (shown in line position).
- S2-1, S2-2 ..... Multiplex filter in/out switch (shown in out position).
- S3-1, S3-2 ..... Dolby in/out select switch (shown in out position).
- S4-1—S4-4 ..... Tape select switch (shown in normal position).
- S5 ..... Power on/off switch (shown in on position).
- S6 ..... AC power voltage select switch.
- VR1, VR2 ..... Input level controls.
- VR3, VR4 ..... Playback gain adjustment VR.
- VR5, VR6 ..... Recording gain adjustment VR.
- VR7, VR8 ..... Output level controls.
- VR9 ..... Erase current adjustment VR.
- VR10 ..... FL meter adjustment VR (for 0dB indication).
- VR11 ..... FL meter adjustment VR (for −20dB indication).
- L1, L2 ..... Bias leakage adjustment coil.
- C109, C110 ..... Bias current adjustment VC.

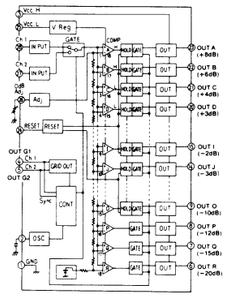
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. K=1,000Ω, M=1,000kΩ. Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise. P=Pico-farads.
- The mark (▼) shows test point. e.g. ▼=test point 1.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position. For measurement, use VTVM.

EQUIVALENT CIRCUIT

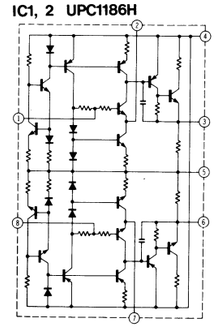
IC3, 4 NE646B



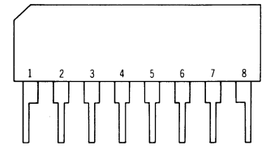
IC5 AN8870



IC1, 2 UPC1186H



TERMINATION (SIDE VIEW)
IC1, 2 UPC1186H



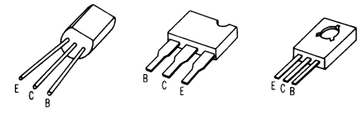
(BOTTOM VIEW)

TRANSISTORS

Q1.2.5.6.13-20.29-32 201.208.216.218.219 222.223

Q7-12.21-28.33-40 202-207.210-215. 220

Q209.217.221



SPECIFICATIONS

* Input level controls ··· MAX
* Output level control ··· MAX

Playback S/N ratio Test tape ··· QZZCFM	Greater than 45dB
Overall distortion Test tape ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRY for Fe-Cr ··· QZZCRZ for Metal	Less than 3.5%
Overall S/N ratio Test tape ··· QZZCRA	Greater than 43dB (without NAB filter)

38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12

CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

NOTES: RESISTORS
ERD ··· Carbon
ERG ··· Metal-oxide
ERO ··· Metal-film
ERX ··· Metal-film
ERQ ··· Fuse type metallic
ERC ··· Solid
ERF ···· Cement

CAPACITORS
ECG□ ····· Ceramic
ECK□ ····· Ceramic
ECC□ ····· Ceramic
ECF□ ····· Ceramic
ECQM ····· Polyester film
ECQE ····· Polyester film
ECQF ····· Polypropylene
ECE□ ····· Electrolytic
ECE□N ··· Non polar electrolytic
ECQS ····· Polystyrene
ECS□ ····· Tantalum

NOTE: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.
RESISTORS	
R1, 2	ERD25FJ101
R3, 4	ERD25FJ682
R5, 6	ERD25FJ680
R7, 8	ERD25TJ104
R9, 10	ERD25FJ562
R13, 14	ERD25TJ273
R15, 16	ERD25FJ101
R17, 18	ERD25FJ100
R19, 20	ERD25TJ104
R21, 22	ERD25FJ101
R23, 24	ERD25TJ274
R25, 26	ERD25TJ104
R27, 28	ERD25FJ682
R29, 30	ERD25FJ472
R31, 32	ERD25FJ562
R39, 40, 41, 42	ERD25TJ394
R49, 50	ERD25TJ105
R51, 52	ERD25FJ332
R55, 56	ERD25TJ473
R59, 60, 61, 62	ERD25FJ102
R63, 64	ERD25TJ104
R65, 66	ERD25TJ274
R67, 68, 69, 70	ERD25TJ683
R79, 80	ERD25FJ681
R81, 82	ERD25FJ182
R89, 90	ERD25FJ821
R93, 94	ERD25FJ392
R95, 96	ERD25FJ102
R97, 98	ERD25TJ683
R102	ERD25TJ333
R105, 106	ERD25FJ821
R107, 108	ERD25FJ562
R109, 110	ERD25FJ821
R111, 112	ERD25FJ392
R113, 114	ERD25FJ152
R115, 116	ERD25FJ222
R117, 118	ERD25TJ333
R119, 120	ERD25TJ183
R121, 122	ERD25TJ823
R123, 124	ERD25FJ102
R125, 126	ERD25FJ152
R127, 128	ERD25FJ682
R129, 130, 131, 132	ERD25FJ270
R133, 134	ERD25FJ680
R135, 136	ERD25FJ121
R137, 138, 139, 140	ERD25FJ562
R141, 142	ERD25FJ102
R143, 144	ERD25TJ684
R145, 146	ERD25FJ562
R149, 150	ERD25FJ472
R153, 154	ERD25FJ472
R159, 160	ERD25FJ180
R201, 202	ERD25FJ102
R206	ERD25TJ333
R207, 208, 209	ERD25TJ223
R210	ERD25TJ333
R211	ERD25TJ473
R212, 213	ERD25FJ562
R214	ERD25TJ223
R215	ERD25TJ153
R216	ERD25FJ472
R218	ERD25FJ103
R219	ERQ14AJ121P
R226, 227, 228	ERG12ANJ221
R229	ERD25FJ332
R230	ERQ14AJ151P
R231	ERD25FJ103
R234 ⚠	ERQ12AJ2R7P
R235 ⚠	ERD25FJ392
R236 ⚠	ERD25FJ472
R237	ERD25FJ392
R238	ERD25FJ682
R239	ERD25TJ123
R240	ERD25FJ562
R241	ERD25FJ272
R242	ERG12ANJ221
R243	ERG12ANJ102
R246	ERD25TJ273
R248	ERX2ANJ5R6
R251	ERD25FJ332
R252	ERD25FJ562
R256	ERD25FJ471
R259	ERD25FJ272
R260	ERD25FJ182
R262	ERD25TJ223
R268	ERD25FJ562
R269	ERD25FJ682
R270	ERD25TJ153
R271	ERD25TJ123
R272	ERD25FJ1R0
R273	ERD25FJ182
R274	ERD25FJ562
R275	ERQ14AJ100P
R276	ERD25FJ822
R277	ERD25TJ223
R278	ERD25FJ221
R279	ERD25FJ101
R280	ERD25FJ822
R281, 282 ⚠	ERG12ANJ181
R284	ERD25TJ124
R285	ERD25FJ122
R286	ERD25TJ473
R287	ERD25FJ562
R288	ERD25TJ223
R292	ERD25FJ182
R295	ERG12ANJ221
R296	ERD25TJ153
R297	ERD25FJ472
R298	ERD25AJ121P
R337	ERD25FJ1R0
R340	ERD25FJ1R0
R347	ERD25TJ153
R348	ERD25TJ273
R349	ERD25TJ563
R356, 357, 358, 359, 360, 361, 362, 363	ERD10TJ473
R401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424	ERD25TJ473

VARIABLE RESISTORS

VR1, 2	QVKDM80RA24
VR3, 4	EVNK4AA00B24
VR5, 6	EVNK4AA00B54
VR7, 8	QWKGTA024A14
VR9	EVNK4AA00B15
VR10	EVNK4AA00B14
VR11	EVNK4AA00B23

CAPACITORS

C1, 2	ECCD1H181JD
C3, 4	ECEA25M4R7R
C5, 6	ECQM1H103KZ
C7, 8	ECEA1AS101
C9, 10	ECEA50ZR47
C11, 12	ECKD1H152MD
C13, 14	ECKD1H391KB
C15, 16	ECEA25M4R7R
C17, 18	ECFWD102KVY
C19, 20	ECEA1AS221
C21, 22	ECFDD183KXY
C25, 26	ECEA1JS4R7
C27, 28	ECFWD123KXY
C29, 30	ECEA1HS100
C31, 32	ECEA2AS2R2
C33, 34	ECEA50MR33R
C35, 36	ECQM1H273JZ
C37, 38	ECQM1H472JZ
C39, 40	ECQM1H562JZ
C41, 42	ECEA1AS221
C43, 44	ECFDD104KXY
C45, 46	ECEA1HS100
C47, 48	ECEA50ZR33
C49, 50	ECQM1H473JZ
C53, 54, 55, 56, 57, 58	ECEA1HS100
C59, 60	ECKD1H821KB
C61, 62, 63, 64	ECEA2AS2R2
C65, 66	ECEA50ZR22
C67, 68	ECEA2AS010
C69, 70	ECEA1HS100
C71, 72	ECKD1H102MD
C73, 74	ECEA1CS221
C75, 76	ECEA50Z2R2
C77, 78	ECEA1HS100
C79, 80	ECEA50ZR68
C81, 82	ECEA1HS100
C83, 84	ECKD1H102MD
C85, 86	ECFDD273KXY
C87, 88	ECFDD103KVY
C89, 90	ECFDD104KXY
C91, 92	ECFDD393KXY
C93, 94	ECFDD473KXY
C95, 96	ECFDD183KXY
C97, 98	ECFDD104KXY
C99, 100	ECFDD473KXY
C101, 102	ECQP1122JZ
C103, 104	ECFDD562KVY
C105, 106	ECEA1HS100
C107, 108	ECEA2AS010
C111, 112	ECEA1HS100
C113, 114	ECQM1H392JZ
C201	ECEA1ES101
C202	ECQM1H473KZ
C204	ECEA1HS100
C205	ECEA1ES470
C206	ECEA2AS010
C207	ECEA1ES221
C208, 209	ECKD1H103ZF
C210	ECEA1AS101
C211	ECEA1CS221
C212	ECEA1ES101
C213	ECQM1H683KZ
C214	ECEA1ES470
C215	ECEA1ES101
C217	ECQP1183JZ
C218	ECQM1H563KZ
C219	ECQM1H333KZ
C220	ECEA1HF100
C221	ECEA50ZR22
C222	ECEA2AS2R2
C223, 224, 225, 226	ECEA1HS100
C227, 228	ECEA1CS472
C229	ECEA1CS471
C230	ECEA1HS100
C231	ECKD1H103ZF
C232 ⚠	ECEA1HS470
C233	ECEA1VS102
C234	ECFDD104KXY
C235	ECFDD473KXY
C236	ECKD1H223ZF
C237	ECEA1ES101
C238	ECEA1VS330
C239	ECSF16E10
C240 ⚠	ECKD1H103ZF
C301, 302, 303, 304, 305, 306	ECKD1H103ZF
C307	ECEA0JS221
C308	ECEA16N10
C309	ECEA1HSR1
C310	ECCD1H331KD
C311, 312	ECKD1H102MD

VARIABLE CAPACITORS

C109, 110	QVC2121

TRANSISTORS

Q1, 2	2SD1011
Q5, 6	2SD965
Q7, 8, 9, 10, 11, 12	2SD636
Q13, 14, 15, 16, 17, 18, 19, 20	2SD1010
Q21, 22, 23, 24, 25, 26	2SD636
Q27, 28	2SD638
Q29, 30, 31, 32	2SD965
Q33, 34, 35, 36, 37, 38	2SD636
Q39, 40	2SA786
Q201	2SA921
Q202, 203	2SB641
Q204	2SD636
Q205	2SB641
Q206, 207	2SD636
Q208	2SD592NCS
Q209	2SD946
Q210	2SD636
Q211	2SB641
Q212, 213, 214	2SD636
Q215	2SB641
Q216	2SD1010
Q217	2SD946
Q218, 219	2SD592NCS
Q220	2SD636
Q221	2SD946
Q222	2SD1011
Q223	2SC1980
Q302	2SB641
Q303, 304, 305	2SD636
Q306	2SD637
Q307	2SB642
Q308	2SD637
Q309	2SB642
Q310	2SD637
Q311	2SB642
Q312, 313	2SB835
Q314, 315	2SD965
Q316, 317	2SD638
Q401, 402, 403, 404, 405, 406, 407, 408	2SC945
Q409, 410, 411, 412, 413, 414, 415, 416	2SA721

DIODES & RECTIFIERS

D1, 2, 3, 4, 5, 6, 7, 8, 9	MA161
D10	SVDRD8.2EB
D11	MA161
D13	RVDRD6R8EB
D14	SM112
D15	RVD1N4748
D16	RVDRD6R2EB
D17, 18, 19, 20 ⚠	SM112
D21, 22	MA161
D23	RVDKB265E
D24, 25, 26, 27, 28	MA161
D301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312	MA161
D313, 314	SM112
D315	2OA90
D316, 317, 318	MA161

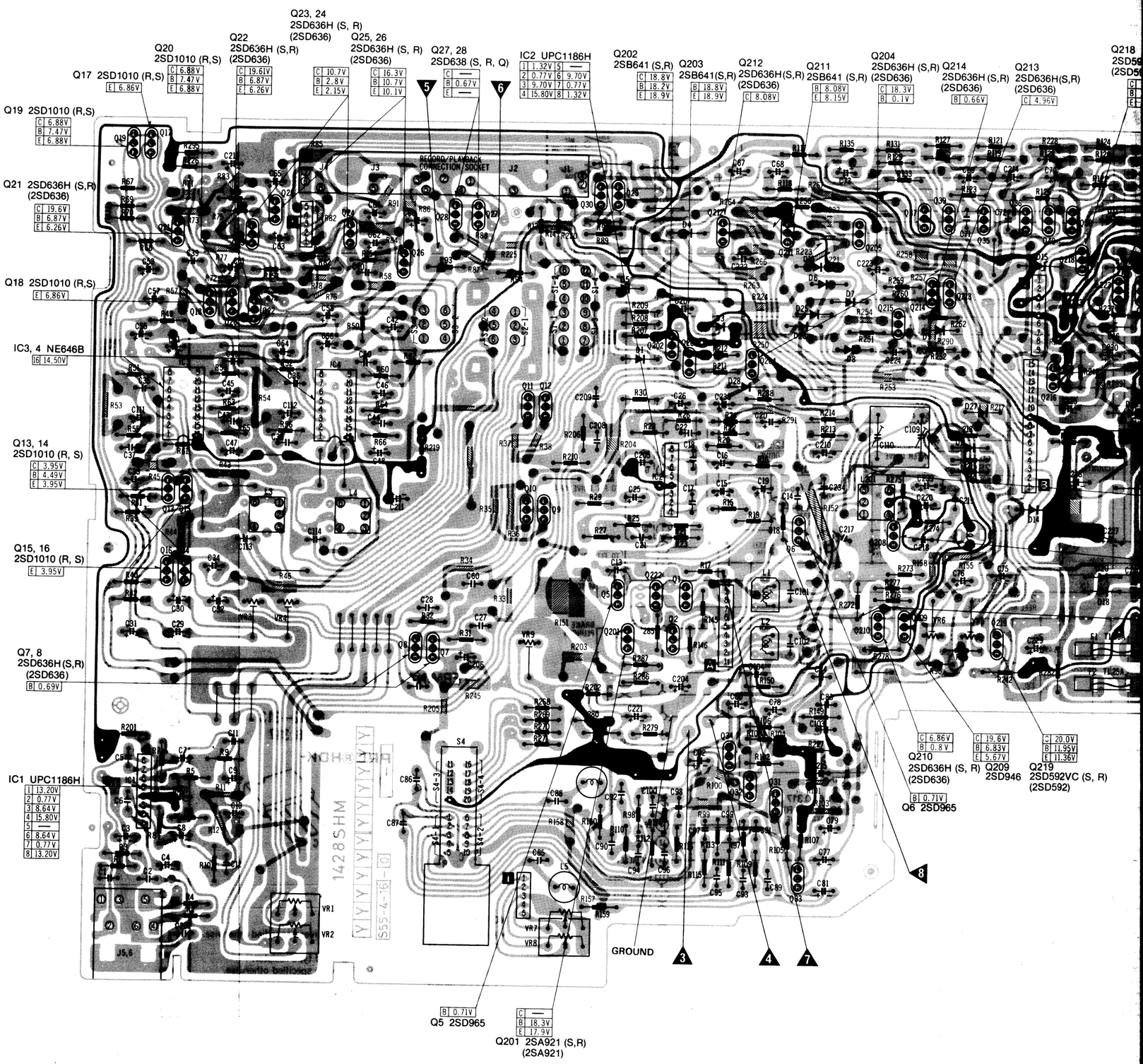
LIGHT EMITTING DIODES

LED301	TLR206
LED302	SLT35GG
LED303	TLY206

INTEGRATED CIRCUITS

IC1, 2	UPC1186H
IC3, 4	NE646B
IC5	AN6870
IC301	MN1400RS
IC303	DN6838

Ref. No.	Part No.	Part Name & Description
TRANSFORMER		
T201 ⚠	QLPD49ELC	AC Power Transformer
COILS		
L1, 2	QLQM0333	Bias Trap Coil
L3, 4	SLM1Z19	MPX Filter
L5, 6, 7	QLQX0332K	Peaking Coil
L201	QLB019BK	Bias Oscillation Coil
L301, 302	QLQZ1014D	Choke Coil
L303	ELEH101KA	Choke Coil
SWITCHES		
S1, 2, 3	QSWY304	Push Switch
S4	QSR4404	Rotary Switch
S5 ⚠	QSW2214	Push Switch (Power ON/OFF)
S6 ⚠	QSR1407H	Rotary Switch (Voltage Selector)
S301	QSS1302	Slide Switch (Timer Switch)
S302	QSS1401	Slide Switch (Memory Switch)
S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K	Key Board Switch
S311	QSB0260	Leaf Switch (Erase Safety Switch)
S312	QSB0261	Leaf Switch (Stop Switch)
S313, 314	QSB0260	Leaf Switch (Playback Switch)
S315	QSB0261	Leaf Switch (Cassette Half Detector)
FUSES		
F1, 2 ⚠	XBAQ125028	Fuse (T 1.25A)
F3 ⚠	XBAQ0013	Fuse (T 200mA)
JACKS		
J1, 2, 3, 4	QEJ5002S	Jack Board Assembly
J5, 6	QJA0257H	Microphone Jack
J7	QJA0249H	Headphones Jack
J8	QJS1960S	8 Pin Socket



38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12

CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

NOTES: RESISTORS
- ERD ··· Carbon
- ERG ··· Metal-oxide
- ERO ··· Metal-film
- ERX ··· Metal-film
- ERQ ··· Fuse type metallic
- ERC ··· Solid
- ERF ··· Cement

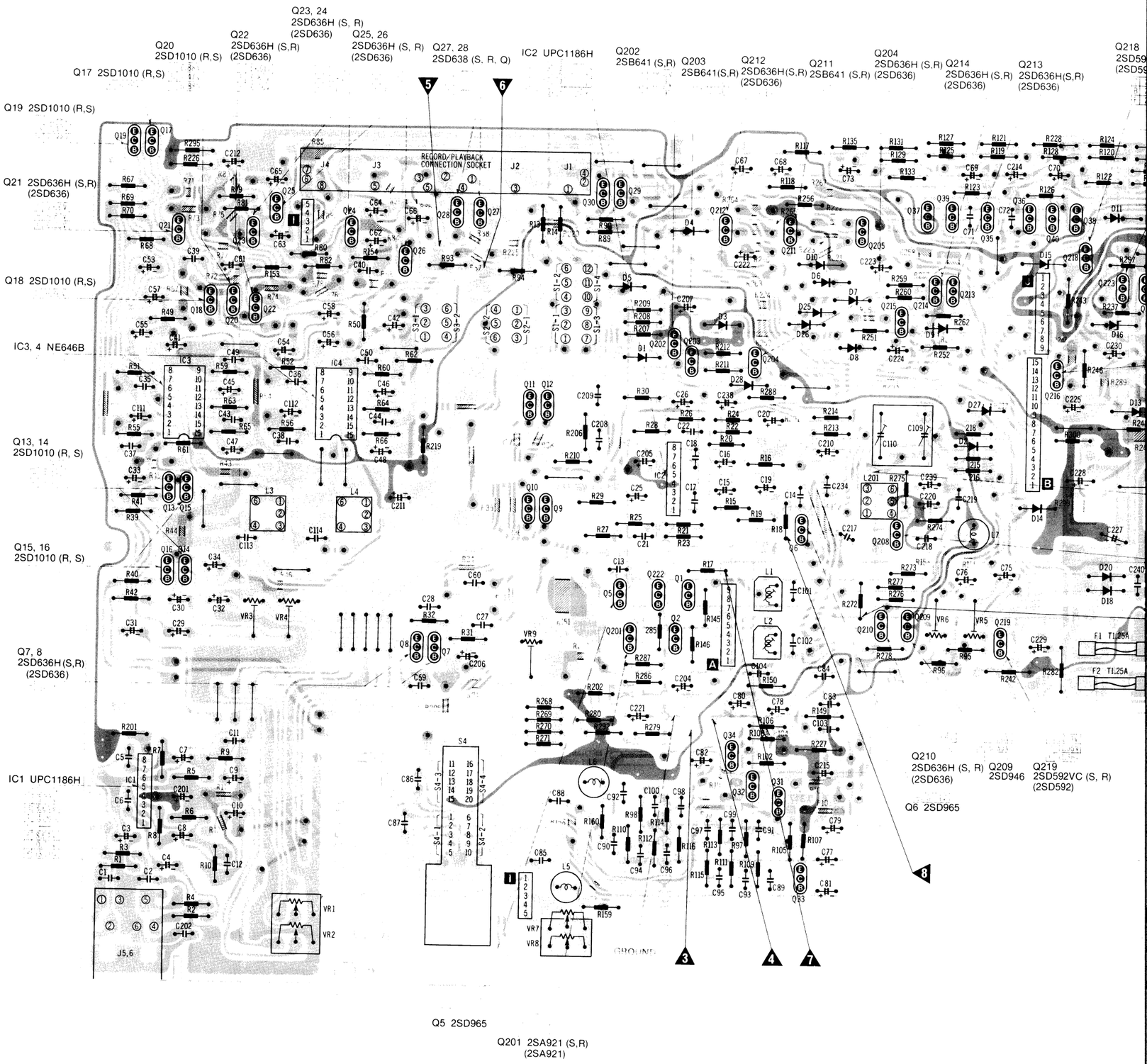
CAPACITORS
- ECG□ ····· Ceramic
- ECK□ ····· Ceramic
- ECC□ ····· Ceramic
- ECF□ ····· Ceramic
- ECQM ····· Polyester film
- ECQE ····· Polyester film
- ECQF ····· Polypropylene
- ECE□ ····· Electrolytic
- ECE□N ··· Non polar electrolytic
- ECQS ····· Polystyrene
- ECS□ ····· Tantalum

NOTE: △ indicates that only parts specified by the manufacturer be used for safety.

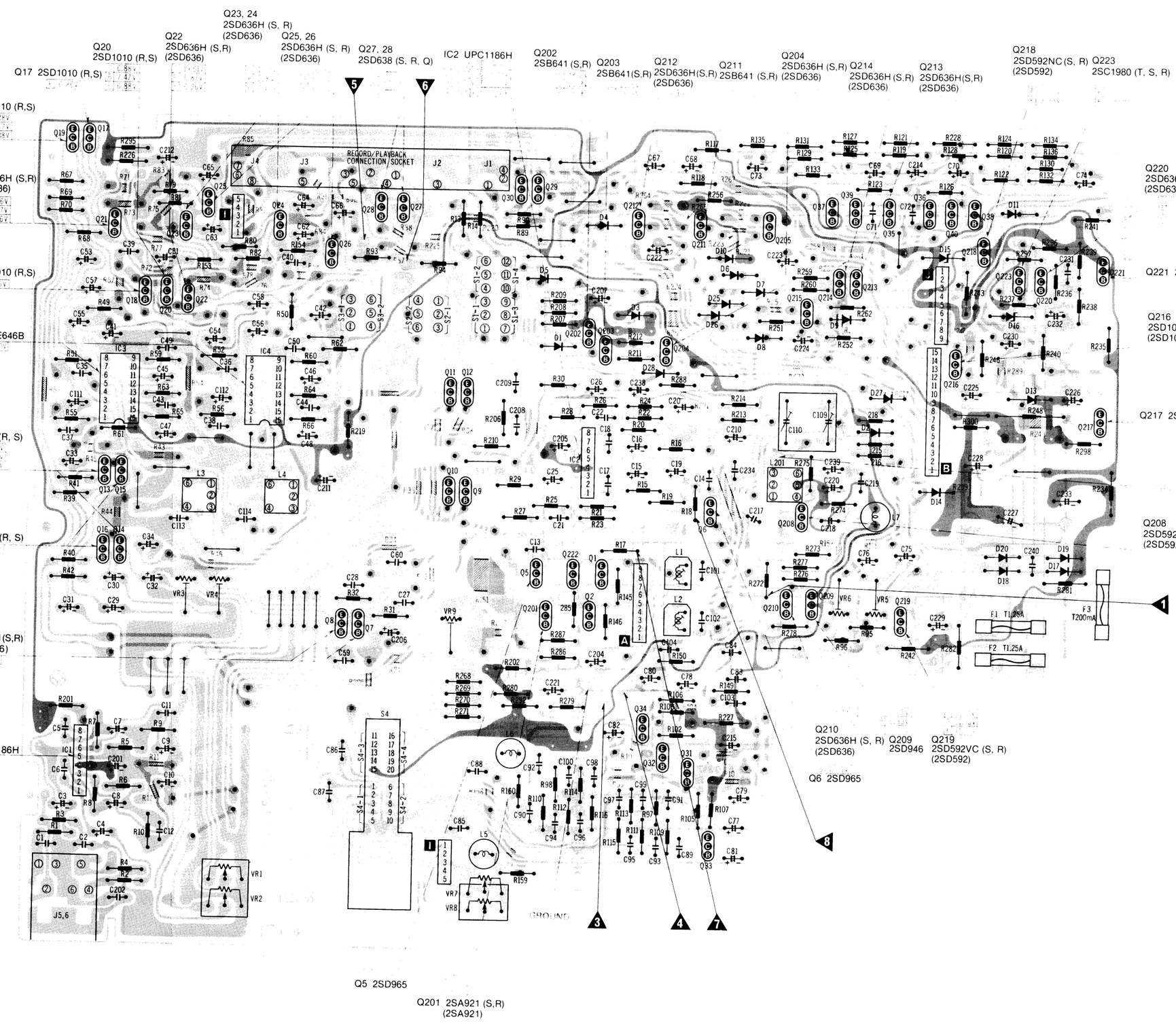
Ref. No.	Part No.
RESISTORS	
R1, 2	ERD25FJ101
R3, 4	ERD25FJ682
R5, 6	ERD25FJ680
R7, 8	ERD25TJ104
R9, 10	ERD25FJ562
R13, 14	ERD25TJ273
R15, 16	ERD25FJ101
R17, 18	ERD25FJ100
R19, 20	ERD25TJ104
R21, 22	ERD25FJ101
R23, 24	ERD25TJ274
R25, 26	ERD25TJ104
R27, 28	ERD25FJ682
R29, 30	ERD25FJ472
R31, 32	ERD25FJ562
R39, 40, 41, 42	ERD25TJ394
R49, 50	ERD25TJ105
R51, 52	ERD25FJ332
R55, 56	ERD25TJ473
R59, 60, 61, 62	ERD25FJ102
R63, 64	ERD25TJ104
R65, 66	ERD25TJ274
R67, 68, 69, 70	ERD25TJ683
R79, 80	ERD25FJ681
R81, 82	ERD25FJ182
R89, 90	ERD25FJ821
R93, 94	ERD25FJ392
R95, 96	ERD25FJ102
R97, 98	ERD25TJ683
R102	ERD25TJ333
R105, 106	ERD25FJ821
R107, 108	ERD25FJ562
R109, 110	ERD25FJ821
R111, 112	ERD25FJ392
R113, 114	ERD25FJ152
R115, 116	ERD25FJ222
R117, 118	ERD25TJ333
R119, 120	ERD25TJ183
R121, 122	ERD25TJ823
R123, 124	ERD25FJ102
R125, 126	ERD25FJ152
R127, 128	ERD25FJ682
R129, 130, 131, 132	ERD25FJ270
R133, 134	ERD25FJ680
R135, 136	ERD25FJ121
R137, 138, 139, 140	ERD25FJ562
R141, 142	ERD25FJ102
R143, 144	ERD25TJ684
R145, 146	ERD25FJ562
R149, 150	ERD25FJ472
R153, 154	ERD25FJ472
R159, 160	ERD25FJ180
R201, 202	ERD25FJ102
R206	ERD25TJ333
R207, 208, 209	ERD25TJ223
R210	ERD25TJ333
R211	ERD25TJ473
R212, 213	ERD25FJ562
R214	ERD25TJ223
R215	ERD25TJ153
R216	ERD25FJ472
R218	ERD25FJ103
R219	ERQ14AJ121P
R226, 227, 228	ERG12ANJ221
R229	ERD25FJ332
R230	ERQ14AJ151P
R231	ERD25FJ103
R234 △	ERQ12AJ2R7P
R235 △	ERD25FJ392
R236 △	ERD25FJ472
R237	ERD25FJ392
R238	ERD25FJ682
R239	ERD25TJ123
R240	ERD25FJ562
R241	ERD25FJ272
R242	ERG12ANJ221
R243	ERG12ANJ102
R246	ERD25TJ273
R248	ERX2ANJ5R6
R251	ERD25FJ332
R252	ERD25FJ562
R256	ERD25FJ471
R259	ERD25FJ272
R260	ERD25FJ182
R262	ERD25TJ223
R268	ERD25FJ562
R269	ERD25FJ682
R270	ERD25TJ153
R271	ERD25TJ123
R272	ERD25FJ1R0
R273	ERD25FJ182
R274	ERD25FJ562
R275	ERQ14AJ100P
R276	ERD25FJ822
R277	ERD25TJ223
R278	ERD25FJ221
R279	ERD25FJ101
R280	ERD25FJ822
R281, 282 △	ERG12ANJ181
R284	ERD25TJ124
R285	ERD25FJ122
R286	ERD25TJ473
R287	ERD25FJ562
R288	ERD25TJ223
R292	ERD25FJ182
R295	ERG12ANJ221
R296	ERD25TJ153
R297	ERD25FJ472
R298	ERD25AJ121P
R337	ERD25FJ1R0
R340	ERD25FJ1R0
R347	ERD25TJ153
R348	ERD25TJ273
R349	ERD25TJ563
R356, 357, 358, 359, 360, 361, 362, 363	ERD10TJ473
R401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424	ERD25TJ473
VARIABLE RESISTORS	
VR1, 2	QVKDM80RA24
VR3, 4	EVNK4AA00B24
VR5, 6	EVNK4AA00B54
VR7, 8	QWKGTA024A14
VR9	EVNK4AA00B15
VR10	EVNK4AA00B14
VR11	EVNK4AA00B23
CAPACITORS	
C1, 2	ECCD1H181JD
C3, 4	ECEA25M4R7R
C5, 6	ECQM1H103KZ
C7, 8	ECEA1AS101
C9, 10	ECEA50ZR47
C11, 12	ECKD1H152MD
C13, 14	ECKD1H391KB
C15, 16	ECEA25M4R7R
C17, 18	ECFWD102KVY
C19, 20	ECEA1AS221
C21, 22	ECFDD183KXY
C25, 26	ECEA1JS4R7
C27, 28	ECFWD123KXY
C29, 30	ECEA1HS100
C31, 32	ECEA2AS2R2
C33, 34	ECEA50MR33R
C35, 36	ECQM1H273JZ
C37, 38	ECQM1H472JZ
C39, 40	ECQM1H562JZ
C41, 42	ECEA1AS221
C43, 44	ECFDD104KXY
C45, 46	ECEA1HS100
C47, 48	ECEA50ZR33
C49, 50	ECQM1H473JZ
C53, 54, 55, 56, 57, 58	ECEA1HS100
C59, 60	ECKD1H821KB
C61, 62, 63, 64	ECEA2AS2R2
C65, 66	ECEA50ZR22
C67, 68	ECEA2AS010
C69, 70	ECEA1HS100
C71, 72	ECKD1H102MD
C73, 74	ECEA1CS221
C75, 76	ECEA50Z2R2
C77, 78	ECEA1HS100
C79, 80	ECEA50ZR68
C81, 82	ECEA1HS100
C83, 84	ECKD1H102MD
C85, 86	ECFDD273KXY
C87, 88	ECFDD103KVY
C89, 90	ECFDD104KXY
C91, 92	ECFDD393KXY
C93, 94	ECFDD473KXY
C95, 96	ECFDD183KXY
C97, 98	ECFDD104KXY
C99, 100	ECFDD473KXY
C101, 102	ECQP1122JZ
C103, 104	ECFDD562KVY
C105, 106	ECEA1HS100
C107, 108	ECEA2AS010
C111, 112	ECEA1HS100
C113, 114	ECQM1H392JZ
C201	ECEA1ES101
C202	ECQM1H473KZ
C204	ECEA1HS100
C205	ECEA1ES470
C206	ECEA2AS010
C207	ECEA1ES221
C208, 209	ECKD1H103ZF
C210	ECEA1AS101
C211	ECEA1CS221
C212	ECEA1ES101
C213	ECQM1H683KZ
C214	ECEA1ES470
C215	ECEA1ES101
C217	ECQP1183JZ
C218	ECQM1H563KZ
C219	ECQM1H333KZ
C220	ECEA1HF100
C221	ECEA50ZR22
C222	ECEA2AS2R2
C223, 224, 225, 226	ECEA1HS100
C227, 228	ECEA1CS472
C229	ECEA1CS471
C230	ECEA1HS100
C231	ECKD1H103ZF
C232 △	ECEA1HS470
C233	ECEA1VS102
C234	ECFDD104KXY
C235	ECFDD473KXY
C236	ECKD1H223ZF
C237	ECEA1ES101
C238	ECEA1VS330
C239	ECSF16E10
C240 △	ECKD1H103ZF
C301, 302, 303, 304, 305, 306	ECKD1H103ZF
C307	ECEA0JS221
C308	ECEA16N10
C309	ECEA1HSR1
C310	ECCD1H331KD
C311, 312	ECKD1H102MD

Ref. No.	Part No.
VARIABLE CAPACITORS	
C109, 110	QVC2121
TRANSISTORS	
Q1, 2	2SD1011
Q5, 6	2SD965
Q7, 8, 9, 10, 11, 12	2SD636
Q13, 14, 15, 16, 17, 18, 19, 20	2SD1010
Q21, 22, 23, 24, 25, 26	2SD636
Q27, 28	2SD638
Q29, 30, 31, 32	2SD965
Q33, 34, 35, 36, 37, 38	2SD636
Q39, 40	2SA786
Q201	2SA921
Q202, 203	2SB641
Q204	2SD636
Q205	2SB641
Q206, 207	2SD636
Q208	2SD592NCS
Q209	2SD946
Q210	2SD636
Q211	2SB641
Q212, 213, 214	2SD636
Q215	2SB641
Q216	2SD1010
Q217	2SD946
Q218, 219	2SD592NCS
Q220	2SD636
Q221	2SD946
Q222	2SD1011
Q223	2SC1980
Q302	2SB641
Q303, 304, 305	2SD636
Q306	2SD637
Q307	2SB642
Q308	2SD637
Q309	2SB642
Q310	2SD637
Q311	2SB642
Q312, 313	2SB835
Q314, 315	2SD965
Q316, 317	2SD638
Q401, 402, 403, 404, 405, 406, 407, 408	2SC945
Q409, 410, 411, 412, 413, 414, 415, 416	2SA721
DIODES & RECTIFIERS	
D1, 2, 3, 4, 5, 6, 7, 8, 9	MA161
D10	SVDRD8.2EB
D11	MA161
D13	RVDRD6R8EB
D14	SM112
D15	RVD1N4748
D16	RVDRD6R2EB
D17, 18, 19, 20 △	SM112
D21, 22	MA161
D23	RVDKB265E
D24, 25, 26, 27, 28	MA161
D301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312	MA161
D313, 314	SM112
D315	2OA90
D316, 317, 318	MA161
LIGHT EMITTING DIODES	
LED301	TLR206
LED302	SLT35GG
LED303	TLY206
INTEGRATED CIRCUITS	
IC1, 2	UPC1186H
IC3, 4	NE646B
IC5	AN6870
IC301	MN1400RS
IC303	DN6838

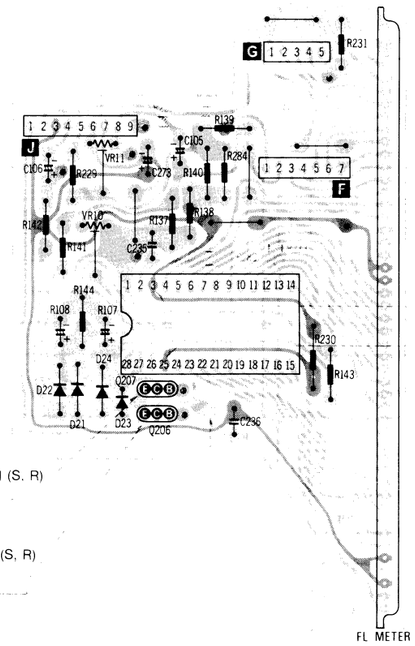
Ref. No.	Part No.	Part Name & Description
TRANSFORMER		
T201 △	QLPD49ELC	AC Power Transformer
COILS		
L1, 2	QLQM0333	Bias Trap Coil
L3, 4	SLM1Z19	MPX Filter
L5, 6, 7	QLQX0332K	Peaking Coil
L201	QLB0198K	Bias Oscillation Coil
L301, 302	QLQZ1014D	Choke Coil
L303	ELEH101KA	Choke Coil
SWITCHES		
S1, 2, 3	QSWY304	Push Switch
S4	QSR4404	Rotary Switch
S5 △	QSW2214	Push Switch (Power ON/OFF)
S6 △	QSR1407H	Rotary Switch (Voltage Selector)
S301	QSS1302	Slide Switch (Timer Switch)
S302	QSS1401	Slide Switch (Memory Switch)
S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K	Key Board Switch
S311	QSB0260	Leaf Switch (Erase Safety Switch)
S312	QSB0261	Leaf Switch (Stop Switch)
S313, 314	QSB0260	Leaf Switch (Playback Switch)
S315	QSB0261	Leaf Switch (Cassette Half Detector)
FUSES		
F1, 2 △	XBAQ125028	Fuse (T 1.25A)
F3 △	XBAQ0013	Fuse (T 200mA)
JACKS		
J1, 2, 3, 4	QEJ5002S	Jack Board Assembly
J5, 6	QJA0257H	Microphone Jack
J7	QJA0249H	Headphones Jack
J8	QJS1960S	8 Pin Socket



RCUIT BOARDS
N AMP CIRCUIT BOARD



FL METER CIRCUIT BOARD

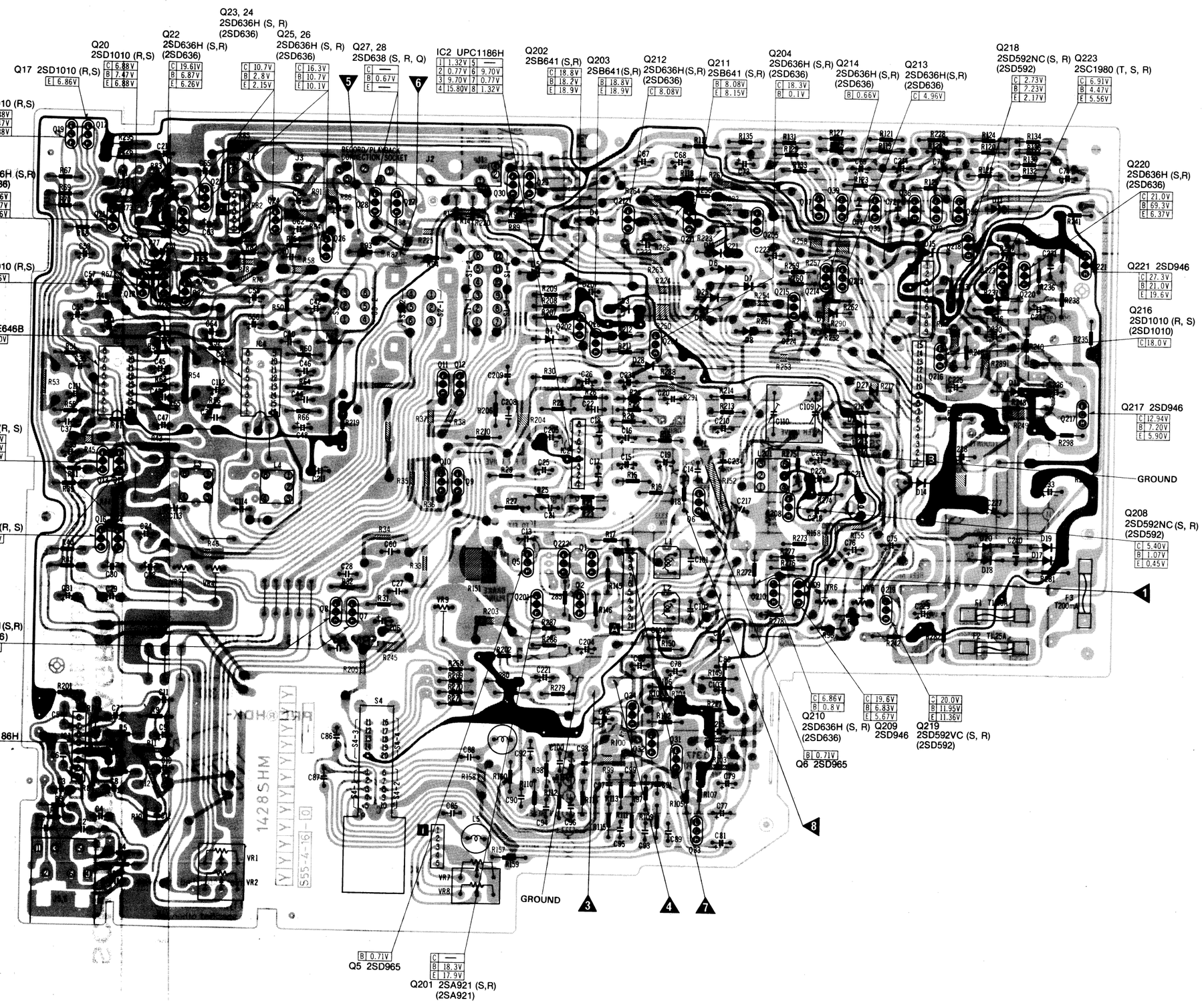


RESET TERMINAL
(Refer to FL Meter adjustment)

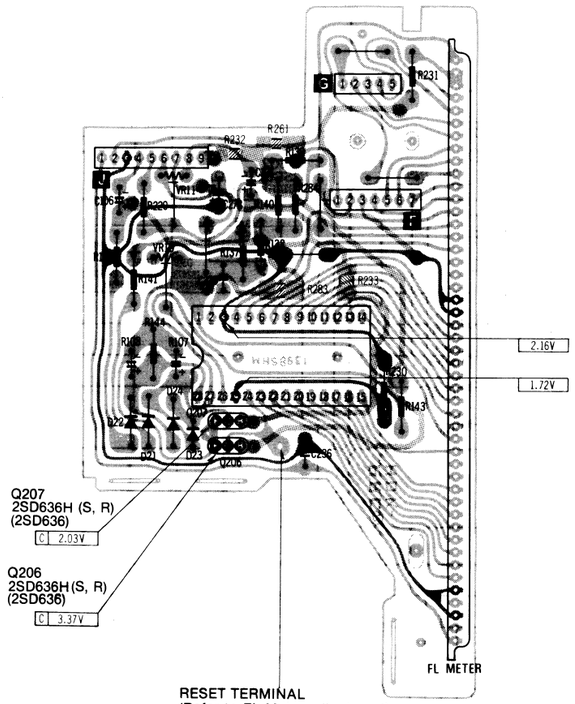
NOTES:

- The circuit shown in ▒▒▒ on the conductor is +B (bias) circuit.
- The circuit shown in ▒▒▒ on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in ▒▒▒ on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols ( ) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in ▒▒▒ are DC voltage between the ground and electrical parts.

RCUIT BOARDS
N AMP CIRCUIT BOARD



FL METER CIRCUIT BOARD

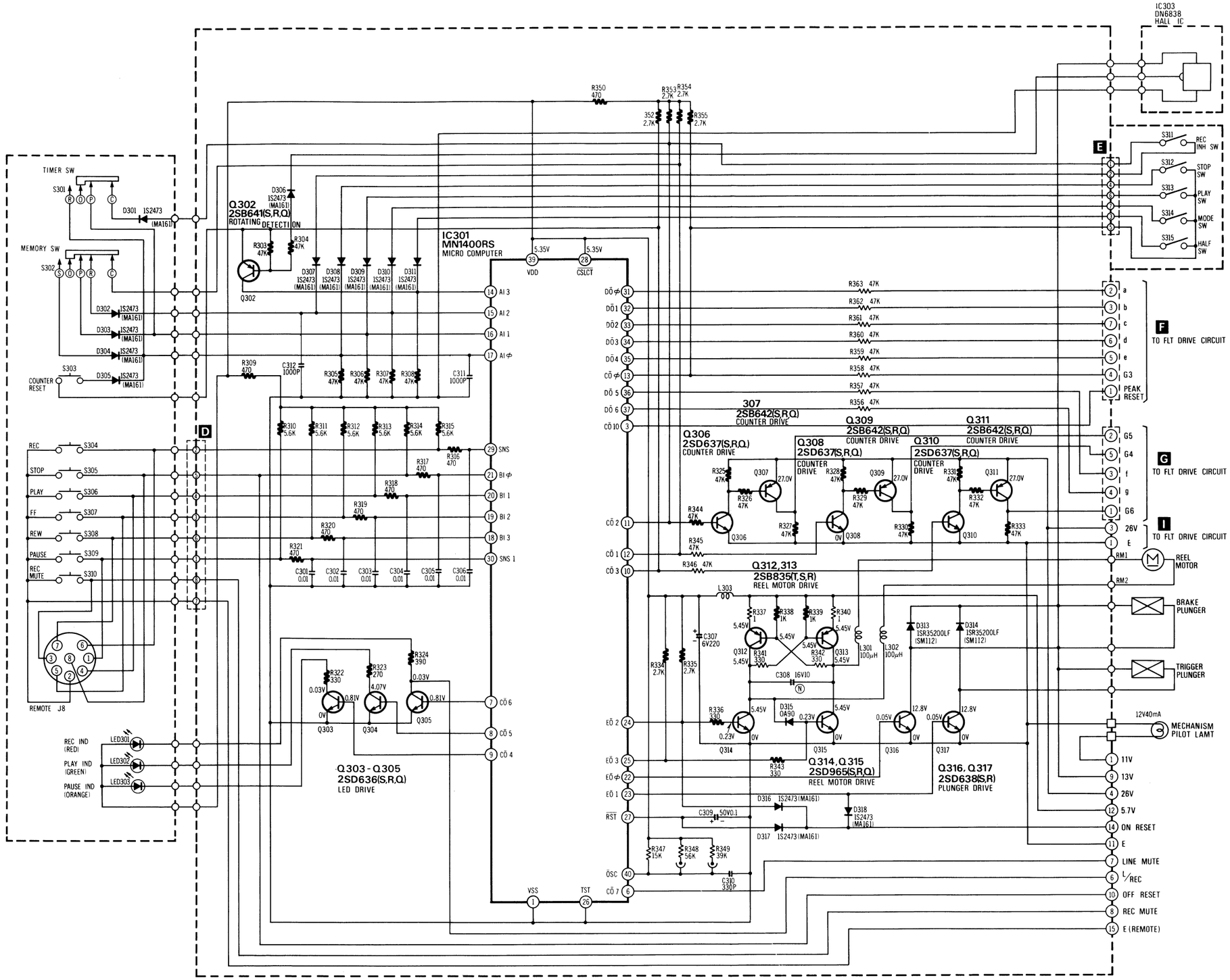


NOTES:

- The circuit shown in ▬ on the conductor is +B (bias) circuit.
- The circuit shown in ▭ on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in ▭ on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols (●) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in ▭ are DC voltage between the ground and electrical parts.

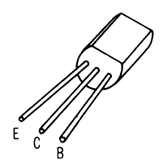
RS-M250

SCHEMATIC DIAGRAM
MAIN CONTROL SECTION

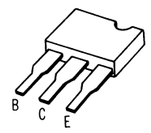


TERMINATIONS (SIDE VIEW)

Q314,315



Q302—313
316,317



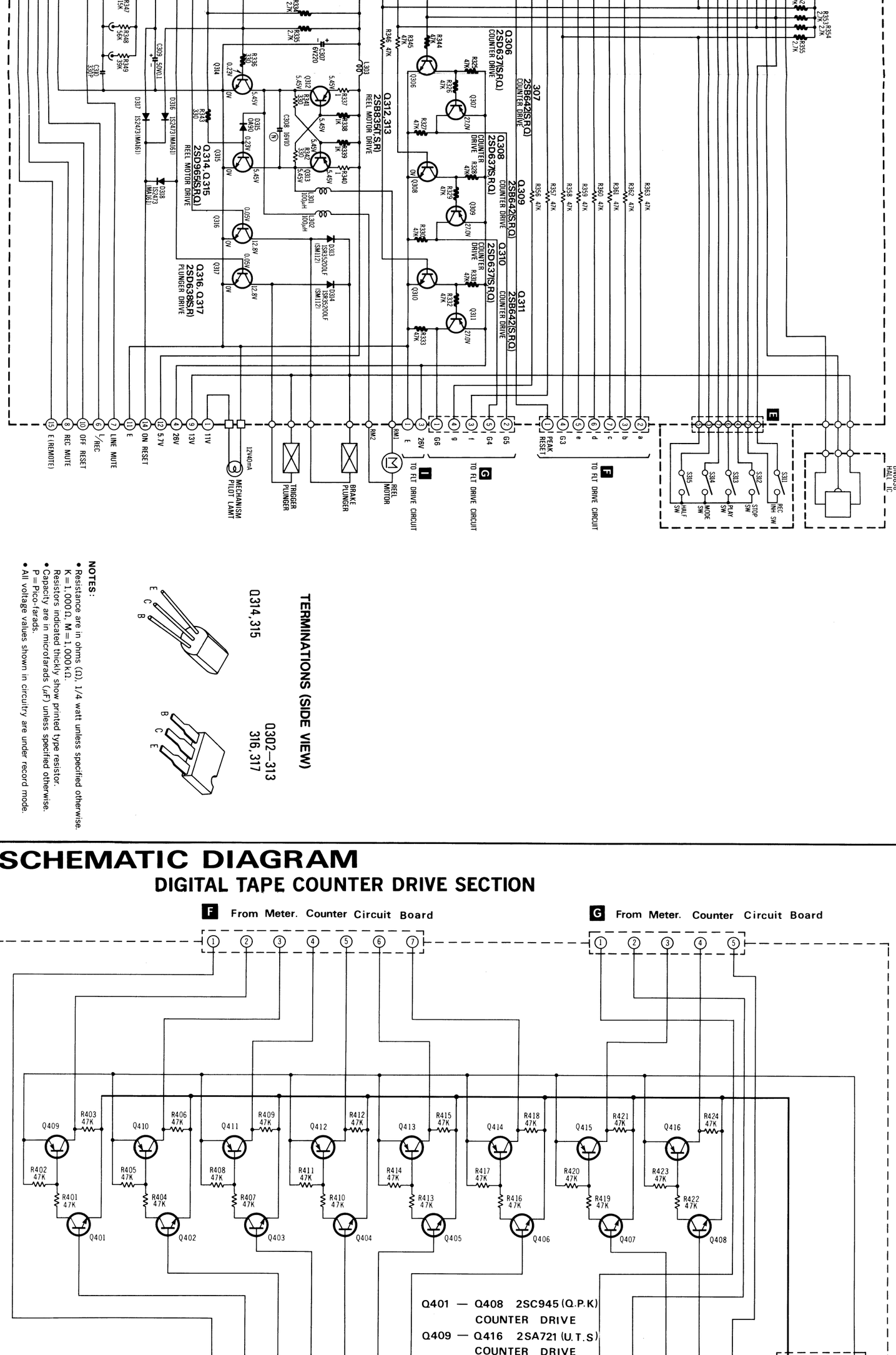
NOTES:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. K = 1,000 Ω, M = 1,000 kΩ. Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- All voltage values shown in circuitry are under record mode.

SCHEMATIC DIAGRAM
DIGITAL TAPE COUNTER DRIVE SECTION

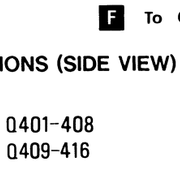
G From Meter. Counter Circuit Board

E From Meter. Counter Circuit Board



TERMINATIONS (SIDE VIEW)

Q314,315



Q302–313
316,317

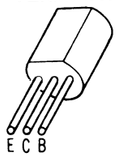
NOTES:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  K = 1,000Ω, M = 1,000kΩ.
  Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise.
  P = Pico-farads.
- All voltage values shown in circuitry are under record mode.

SCHEMATIC DIAGRAM

DIGITAL TAPE COUNTER DRIVE SECTION

TERMINATIONS (SIDE VIEW)



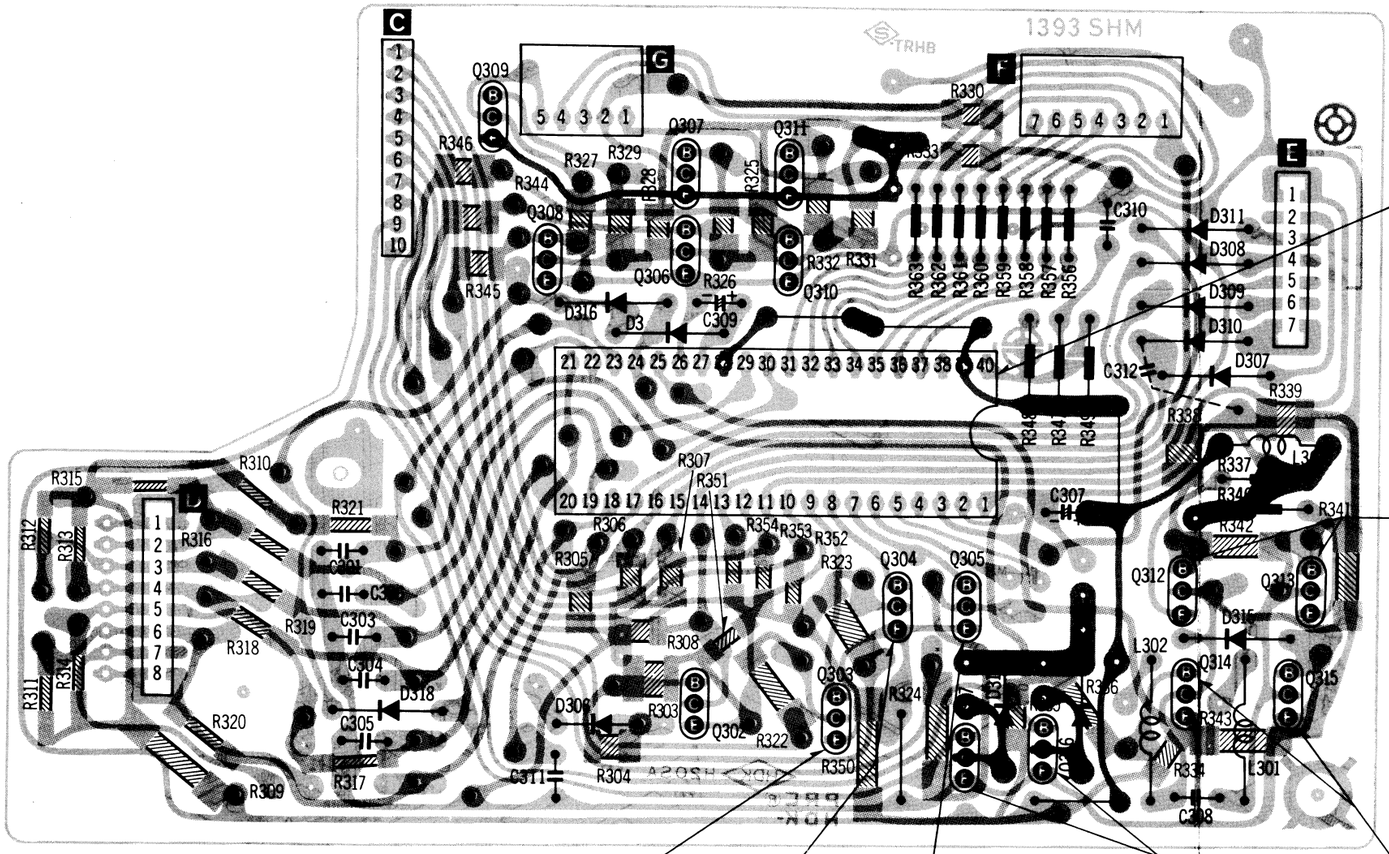
Q401-408
Q409-416

NOTE:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  K = 1,000Ω.

CIRCUIT BOARD

MAIN CONTROL CIRCUIT BOARD



IC301
MN1400RS

1	0V
6	0.02V
18 — 21	5.35V
26	0V
27	5.1V
28 — 30	5.35V
39	5.35V

Q312, 313
2SB835 (T, S, R)

C	5.45V
B	5.45V
E	5.45V

Q314, 315
2SD965 (S, R, Q)

C	5.45V
B	0.23V
E	0V

Q303
2SD636(S, R, Q)

C	0.03V
B	0.81V
E	0V

Q304
2SD636(S, R, Q)

C	4.07V
B	0.02V
E	0V

Q305
2SD636(S, R, Q)

C	0.03V
B	0.81V
E	0V

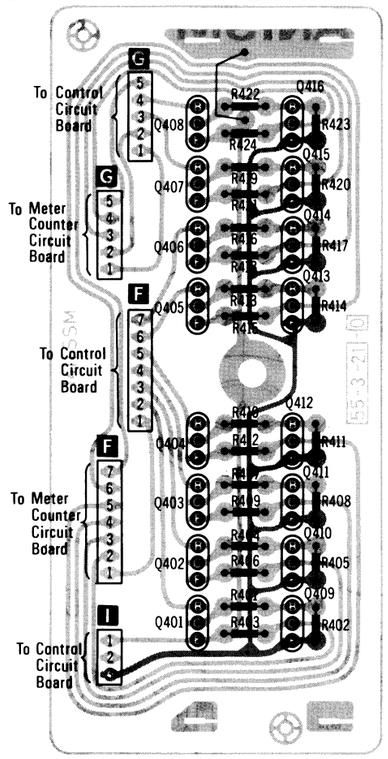
Q316, 317
2SD638 (S, R)

C	12.8V
B	0.05V
E	0V

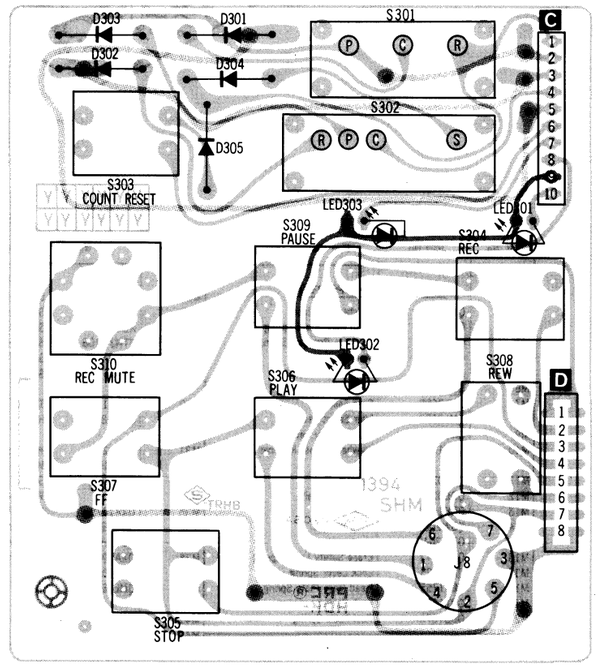
NOTES:

- The circuit shown in ▬ on the conductor is +B (bias) circuit.
- The circuit shown in ▬ on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in ▬ on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols (●) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in ☐ are DC voltage between the ground and electrical parts.

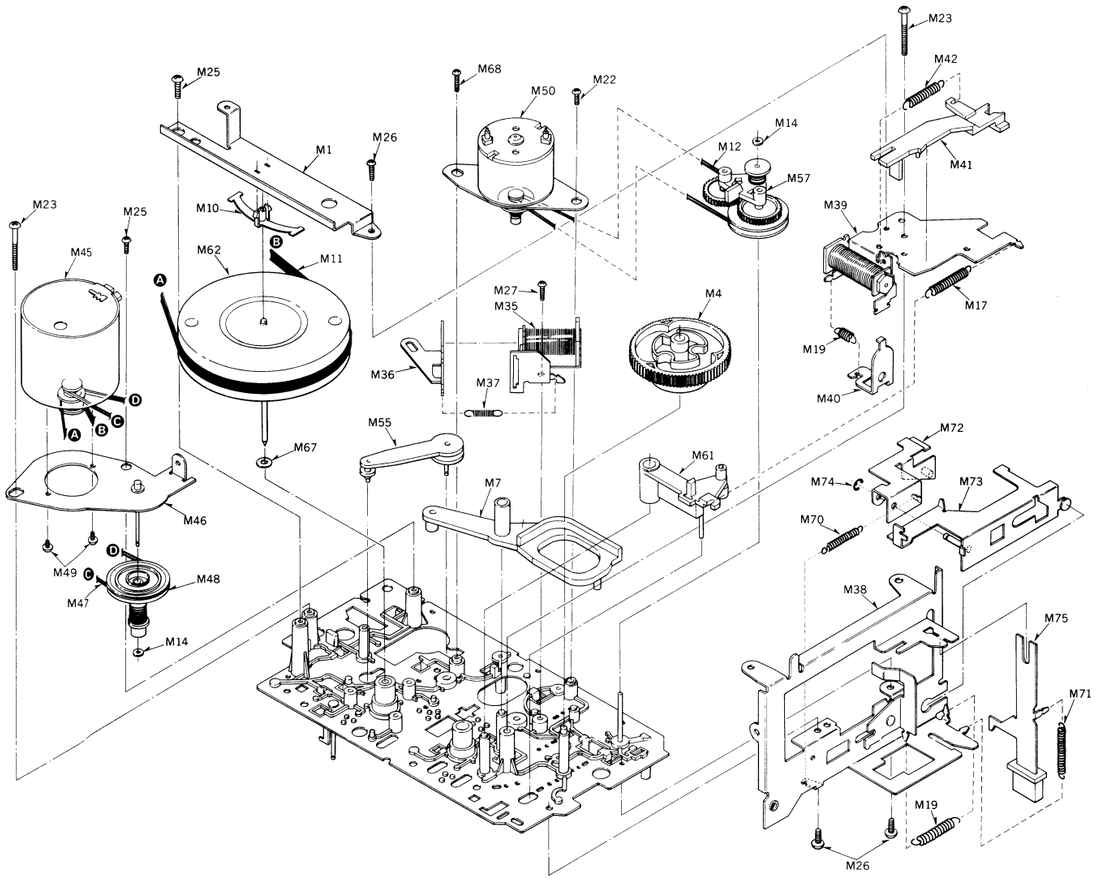
DIGITAL TAPE COUNTER DRIVE CIRCUIT BOARD

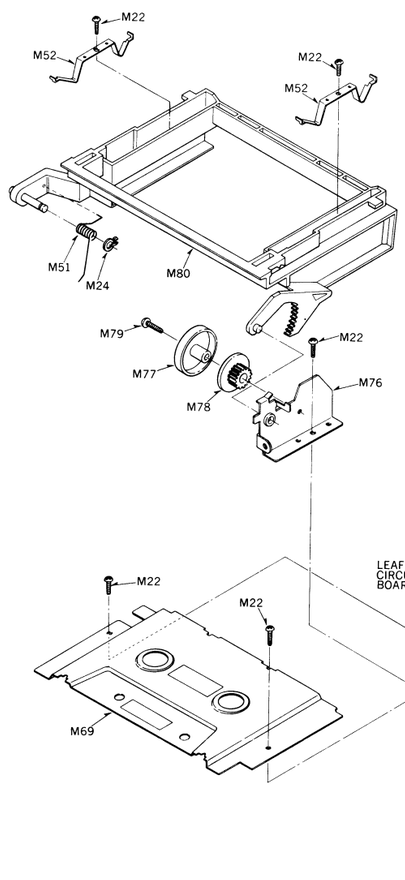


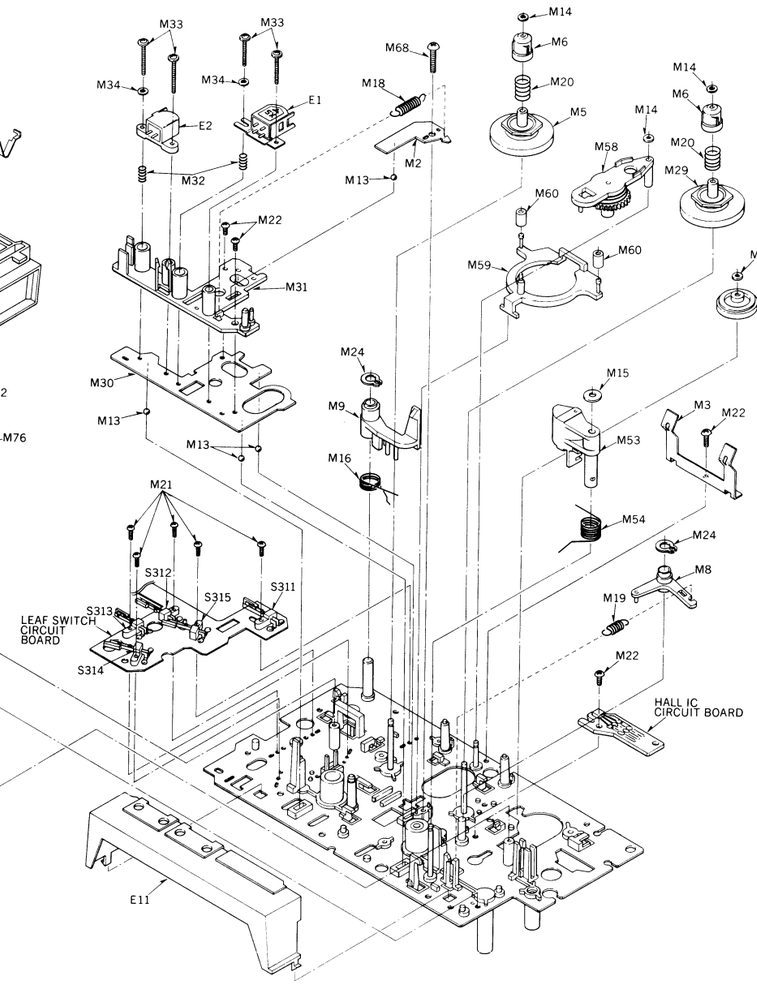
CONTROL KEY SWITCH CIRCUIT BOARD



MECHANISM EXPLODED VIEWS







Ref. No.	Part No.	Part Name & Description
		MECHANICAL PARTS
M1	QMA3951	Flywheel Retainer
M2	QBP1894	Head Base Plate Spring
M3	QBP1895	Cassette Pressure Spring
M4	QDG1214	Main Gear
M5	QDR1146	Supply Reel Table
M6	QMB1336	Reel Table Hub
M7	QML3655	Cam Follower
M8	QML3660	Idler Select Lever
M9	QML3661	Erase Safety Lever
M10	QMZ1253	Flywheel Thrust Retainer
M11	QDB0291	Capstan Belt
M12	QDB0287	Reel Motor Belt
M13	QDK1012	Steel Ball
M14	QBW2008	Snap Washer
M15	QBW2046	"
M16	QBN1772	Erase Safety Lever Spring
M17	QBT1725	Lock Lever Spring
M18	QBT1755	Head Base Plate Spring
M19	QBT1605	Lock Spring
M20	QBC1373	Reel Table Spring

Ref. No.	Part No.	Part Name & Description
M21	XTN2+6B	Screw ⊕2×6
M22	XTN26+6B	Screw ⊕2.6×6
M23	XTN3+24B	Screw ⊕3×24
M24	XUB4FT	Stop Ring
M25	XTN3+10B	Screw ⊕3×10
M26	XTN3+6B	Screw ⊕3×6
M27	XTN26+8B	Screw ⊕2.6×8
M29	QXD0120	Takeup Reel Table Assembly
M30	QMK1867	Head Base Plate
M31	QMZ1252	Head Spacer
M32	QBC1103	Head Spring
M33	XSN2+16	Screw ⊕2×16
M34	XWG2	Washer
M35	QXA1075	Brake Plunger Assembly
M36	QML3650	Plunger Lever
M37	QBT1199	Plunger Spring
M38	QXA1073	Side Angle Assembly
M39	QXA1076	Trigger Plunger Assembly
M40	QML3651	Trigger Plunger Lever
M41	QML3653	Control Lever
M42	QBT1278	Record Lock Lever Spring

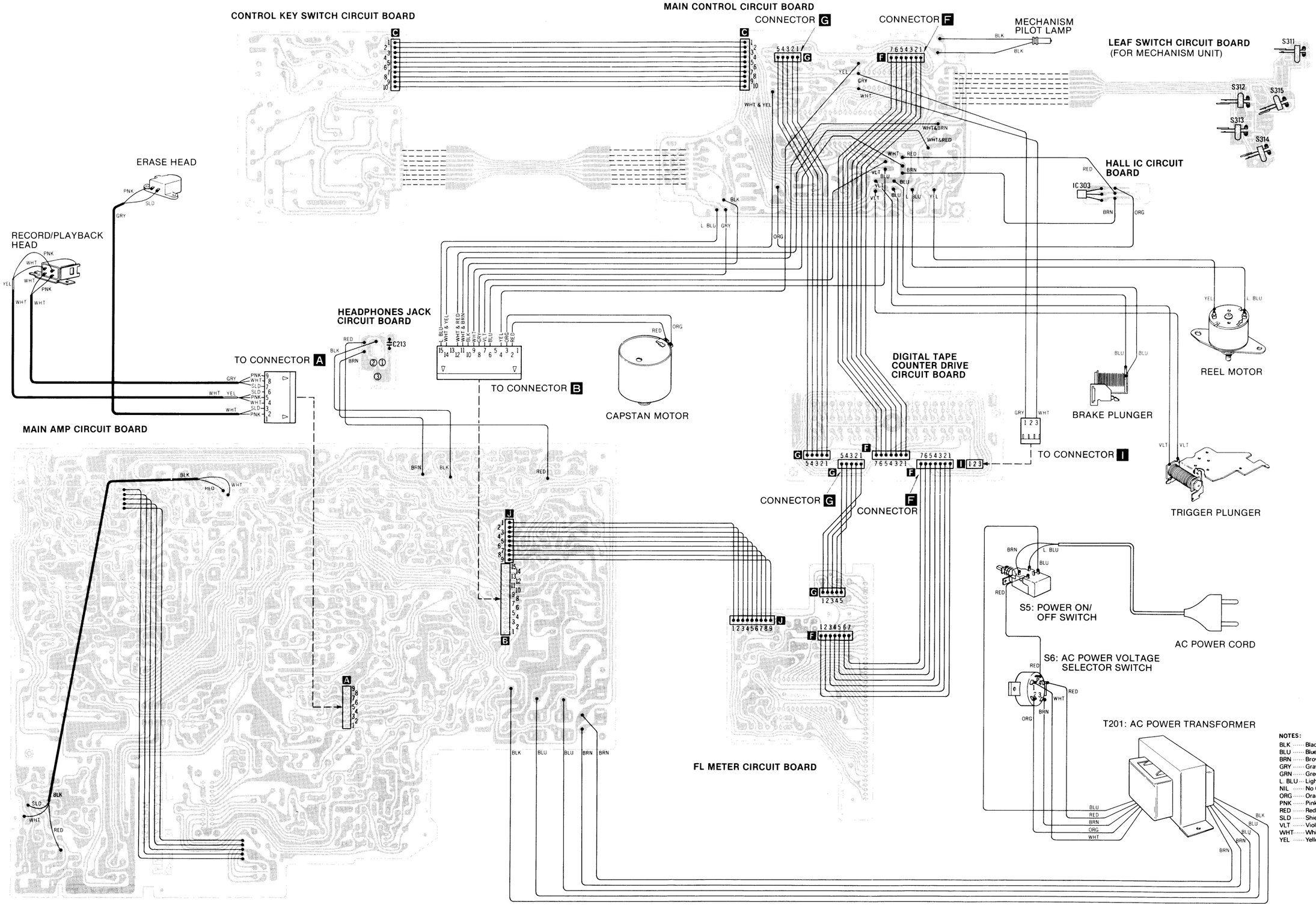
Ref. No.	Part No.	Part Name & Description
M45	QXU0194	Capstan Motor Assembly
M46	QXA1077	Motor Retainer Assembly
M47	QDB0286	Takeup Belt
M48	QXP0621	Takeup Pulley
M49	XSN26+3	Screw ⊕2.6×3
M50	QXU0193	Reel Motor Assembly
M51	QBN1781	Eject Spring
M52	QBP1771	Holder Spring
M53	QXL1406	Pressure Roller Lever
M54	QBN1771	Pressure Roller Spring
M55	QXL1423	Idler Lever Assembly
M56	QXI0116	Takeup Idler
M57	QXL1408	Swing Gear Lever Assembly
M58	QXL1409	Fast Wind Arm Assembly
M59	QML3659	Brake Lever
M60	QBG1132	Brake Rubber
M61	QXL1411	Lock Lever Assembly
M62	QXF0172	Flywheel Assembly
M67	QBW2049	Washer
M68	XTN26+10B	Screw ⊕2.6×10
M69	QXH0346	Mechanism Cover
M70	QBT1691	Lamp Lever Spring

Ref. No.	Part No.	Part Name & Description
M71	QBT1566	Intermediate Lever Spring
M72	QXL1414	Lock Lever-A
M73	QXL1415	Lock Lever-B
M74	XUC25FT	Stop Ring
M75	QXR0678 "Silver Type"	Eject Button Assembly
	QXR0693 "Black Type"	"
M76	QMA3981	Cassette Holder Angle
M77	QKJ0419	Dumper Gear Holder
M78	QDG1219	Dumper Gear
M79	XTN26+8B	Screw ⊕2.6×8
M80	QKF2084H	Cassette Holder

SPECIFICATIONS

Pressure of pressure roller	350±10g
Wow and flutter (JIS) Test tape···QZZCWAT	Less than 0.055% (WRMS)

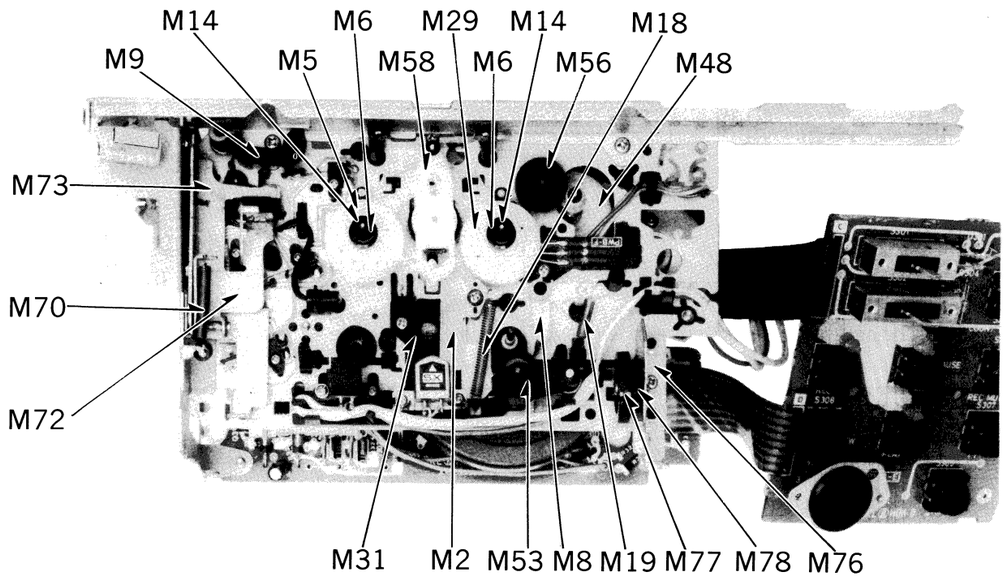
WIRING CONNECTION DIAGRAM

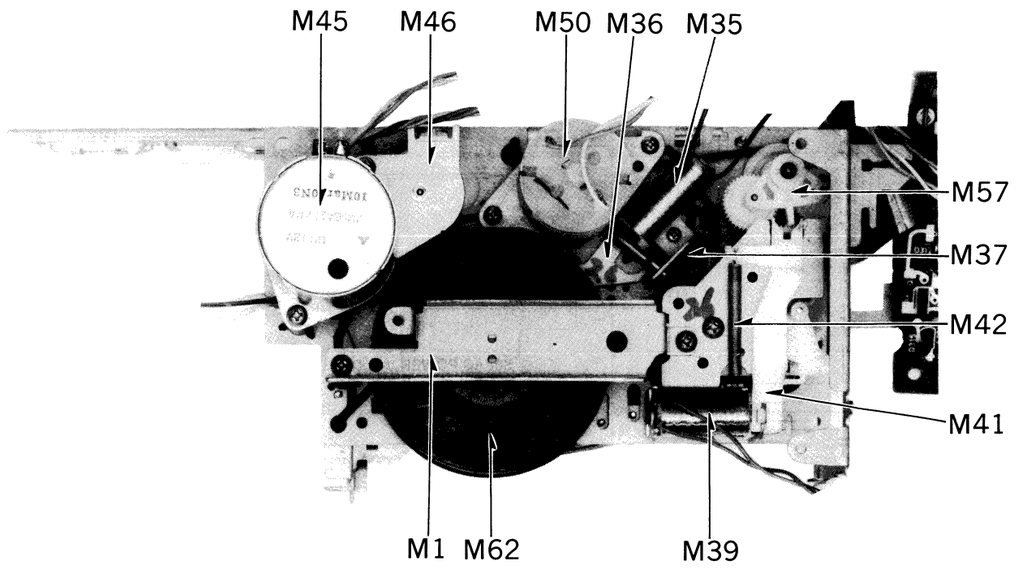


NOTES:

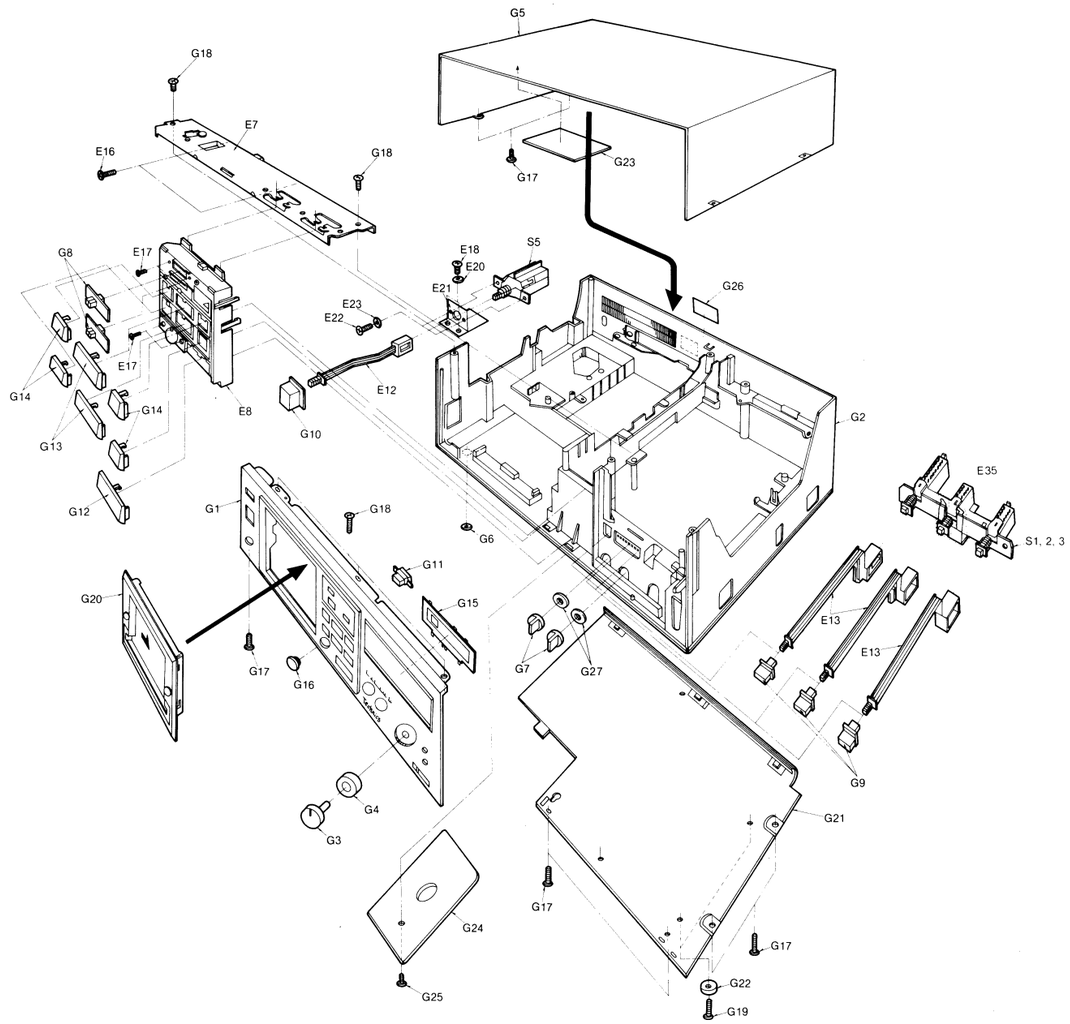
- BLK ..... Black
- BLU ..... Blue
- BRN ..... Brown
- GRY ..... Gray
- GRN ..... Green
- L. BLU ... Light Blue
- NIL ..... No Color Mark
- ORG ..... Orange
- PNK ..... Pink
- RED ..... Red
- SLD ..... Shield Wire
- VLT ..... Violet
- WHT ..... White
- YEL ..... Yellow

MECHANISM PARTS LOCATION





CABINET PARTS



Ref. No.	Part No.	Part Name & Description
		CABINET PARTS
G1	QYP0983	Front Panel Assembly
	"Silver Type"	
	QYP0983K	"
	"Black Type"	
G2	QKM1448H	Main Case
	"Silver Type"	
	QKM1448K	"
	"Black Type"	
G3	QYT0586	Volume Knob-A
	"Silver Type"	
	QYT0586K	"
	"Black Type"	
G4	QYT0587	Volume Knob-B
	"Silver Type"	
	QYT0587K	"
	"Black Type"	
G5	QGC1195	Case Cover
	"Silver Type"	
	QGC1195K	"
	"Black Type"	
G6	QKA1081	Rubber Foot
G7	QGT1504	Control Knob-A
	"Silver Type"	
	QGT1504K	"
	"Black Type"	
G8	QGT1505	Control Knob-B
	"Silver Type"	
	QGT1505K	"
	"Black Type"	

Ref. No.	Part No.	Part Name & Description
G9	QGO1694N	Push Button
	"Silver Type"	
	QGO1694K	"
	"Black Type"	
G10	QGO1763	Push Button (Power Switch)
	"Silver Type"	
	QGO1763K	"
	"Black Type"	
G11	QGO1764	Push Button (Counter Reset)
	"Silver Type"	
	QGO1764K	"
	"Black Type"	
G12	QGO1765	Operation Button (Stop)
G13	QGO1766	Operation Button (Play, Pause)
G14	QGO1767	Operation Button (Rec, Rec-Mute, FF, Rew)
G15	QGL1146	Meter Cover
	"Silver Type"	
	QGL1146Y	"
	"Black Type"	
G16	QKF9001	Remote Control Jack Cover
	"Silver Type"	
	QKF9001K	"
	"Black Type"	
G17	XTN3+10B	Screw +3×10
G18	XTS3+10B	"
G19	QHQ1299	Screw

Ref. No.	Part No.	Part Name & Description
G20	QYF0459	Cassette Lid Assembly
	"Silver Type"	
	QYF0459K	"
	"Black Type"	
G21	QGC1196	Bottom Case
G22	QKA1083	Rubber Foot
G23	QEQ1546	Shield Plate Assembly
G24	QGC1204	Sub Bottom Case
G25	XTN35+20BFB	Screw +3.5×20
G26 [B]	QGS2840	Main Name Plate
÷For United Kingdom.		
G27	QBH0125A	Volume Shelter
		ACCESSORIES
A1	RP023A	Connection Cord
A2 [B]	QQT2891	Instruction Book
÷For all European areas except United Kingdom.		
[B]	QQT2890	"
÷For United Kingdom.		
		PACKINGS
P1	QPN4064	Inside Carton
P2	QPA0574	Cushion-A
P3	QPA0575	Cushion-B
P4	XZB50X65A02	Poly Bag
P5	QPS0434	Pad
P6	QPC0072	Sheet
P7	QPA0585	Spacer

ARD
Y.F
D DK B
Printed in Japan

ORDER NO. ARD- 8311033P

Parts Change Notice

(D)...For all European areas except United Kingdom.
(B)...For United Kingdom.
(N)...For Asia, Latin America, Middle East and Africa areas.
(A)...For Australia.
(P)...For U.S.A.
(C)...For Canada.

Model No.

RS-M250X

Please revise the original parts list in the Service Manual to conform to the change(s) shown herein. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change	*The circled item indicates the reason. If no marking, see the Notes in the bottom column.
1. Improve performance	
2. Change of material or dimension	
3. To meet approved specification	
4. Standardization	
5. Addition	
6. Deletion	
7. Correction	
8. Other	

Interchangeability Code			**The circled item indicates the interchangeability. If no marking, see the Notes in the bottom column.
	Parts	Set Production	
A	Original → Early New → Late		Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original → Early New → Late		Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
C	Original → Early New → Late		New parts only may be used in early or late production sets. Stock new parts.
D	Original → Early New → Late		Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Other		

Part Number

Model No.	Ref. No.	Original Part No.	New Part No.	Notes (*-**)	Part Name & Descriptions
RS-M250X	M52(N/A/P/C)	QBP1771	QBP1923	2-C	Holder Spring
"	M58	QXL1409	QXL1604	"	Fast Wind Arm Assembly
"	G6	QKA1081	QKA1093	"	Rubber Foot
"	G20	QYF0459H	QYF0459	7	Cassette lid Assembly

File this Parts Change Notice with your copy of the Service Manual.

Origianl Service Manual is Model No. RS-M250(D/B) Order No. ARD8007079C.
(N/A) Order No. ARD8010109C17.
(P/C) Order No. ARD8010108C17.

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National / Panasonic

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